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DISCUSSION PAPER ON MARITIME COOPERATION IN EDUCATION AT THE POST-SECONDARY LEVEL

Submitted in collaboration by:

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MARITIME COOPERATION IN EDUCATION AT THE POST-SECONDARY LEVEL
EXECUTIVE SUMMARY

This discussion paper was prepared in response to the directive of the Council of Maritime Premiers, through Committee of the Maritime Forum, (Minute 79D-06) to identify opportunities for strategic cooperation in post-secondary education infrastructure and to indicate ways the post-secondary education sector can contribute to the competitiveness of the Maritime economy.

Section 2 of the paper provides a description of the educational systems in the Maritimes, to help understand their structure, composition and similarities as a base for cooperative efforts. The post-secondary education system is extensive in the Maritime region. A network of college level institutions provides education and skills training which are responsive to community and regional needs. Various adult literacy services and basic education are also delivered through college level institutions. There are eighteen universities in the Maritime Provinces, co-ordinated through the Maritime Provinces Higher Education Commission (MPHEC); three non-university post-secondary institutions are also under MPHEC coordination. The mandate of the MPHEC which was established in 1974 by the Council of Maritime Premiers (CMP) is "to assist the Provinces and universities in attaining a more efficient and effective utilisation and allocation of resources in the field of higher education in the region." In addition to descriptions of educational systems, the function and structure of student aid in the Maritime provinces are outlined in the paper. The need to improve the effectiveness of the Student Aid Program is discussed, noting that coordination at both the policy and administration levels among the three provinces would be beneficial.

In **Section 3** of the paper, the role of post-secondary education in improving the competitiveness of the economy is discussed. Post-secondary education is a key infrastructure component of the economy, and evidence suggests that it is an essential factor in achieving economic growth. Similarly, increased literacy rates can be linked to higher rates of economic growth. In a growing "information society" there is also a requirement for people with higher skills in reading, writing, and scientific and technical literacy. Overall, education/training supports industry's need for technological development, innovation, and a proficient and stable human resource base. Because of this, post-secondary education is the key to successfully competing in the global market. Improved efficiency and effectiveness in post-secondary education can be achieved through cooperation. In turn, when human resource development is achieved more efficiently, improved competitiveness and productivity result.

In **Section 4** of the paper, many examples of existing cooperation in the Maritime provinces which are worth continuing or expanding are highlighted; several potential areas for developing more cooperation are also discussed. It is noted that better communication with industry by universities could help to improve the transfer of research and technology. The Dalhousie Office of Technology Transfer, Manufacturing Technology Centre and the Atlantic Canada Alliance for Advanced Manufacturing and Engineering are examples of initiatives to coordinate technology transfer in the region. Also, the level of university enrolment in mathematics, science and engineering programs is an issue of concern. This issue will be given further consideration as university role and capacity statements are completed for universities in the Maritime provinces by the MPHEC and the Nova Scotia Council on Higher Education.

The paper outlines that cooperative efforts could help to achieve more systematic and efficient arrangements for professional development of instructors and administrators. Various forms of professional development are undertaken in the Atlantic region for university and college administrators. However, regional professional development initiatives for college instructors have been lacking and it would be beneficial to introduce them. The discussion also notes that coordinated curriculum development for college programs is important for serving industry with a workforce possessing appropriate skills, and that more cooperation could be sought in the region. Cooperation among

community colleges in both professional development and curriculum development would serve to enhance the quality of education as well as improve cost efficiency since total costs of initiatives would be shared by a group of institutions.

Section 4 of the paper also includes a discussion of cooperation in the area of program development. Regional cooperation in program development for universities takes place through the work of the Maritime Provinces Higher Education Commission. More cooperation among the Maritime provinces in college level program planning is also desirable because it helps to avoid unnecessary duplication and achieve economies in delivering quality education. In addition, the expansion of regional student accessibility to college programs is beneficial because arrangements to allow access to an existing program often cost less than developing another program in the region. Human resource planning in attempt to balance supply with demand for educated/trained personnel in the labour market also warrants consideration for additional cooperation. This could involve more coordination in college program planning, sectoral studies, analyses of labour requirements for major projects, as well as discussion of human resource planning assistance to businesses.

The paper notes that cost effectiveness can be achieved through the cooperative tendering/purchase of goods and services commonly used by educational institutions. The Maritime Provinces' ***Memorandum of Agreement on the Reduction of Interprovincial Trade Barriers: Government Procurement***, applies to many government departments in the Maritimes including those concerned with education. Community colleges are included; however, universities are not at this time. Discussions with universities will be undertaken by the Assessment Review Committee of the Maritime Procurement Agreement to develop processes for operation under the principle of the Agreement. Such processes would be in addition to cooperative approaches which already exist in universities such as Interuniversity Services Incorporated and the N.B.-P.E.I. Educational Computer Network.

The situation of libraries in the university system is an another area relating to cost effectiveness which is discussed in the paper. University libraries are challenged by maintaining quality resources within financial constraints. Further cooperation in resource sharing, collection development, and systems acquisition/development may enhance the function of libraries. The NOVANET data base system is an example of cooperation that could be encouraged.

The paper addresses the need for interaction with industry with regard to: improved communication, entrepreneurial development and cooperative education. Measures to improve information/communication between educational institutions and industry would be beneficial for the region. Coordinated communication about available programs, skills, research and technology would better serve industry needs. Another potential area of cooperation which is discussed is the role of post-secondary education in training entrepreneurs; the establishment of the Entrepreneurship Development program at Holland College may serve as a foundation for expansion of education in this field. The paper also notes that activities which would improve employer awareness of available cooperative education programs and develop recognized approaches or standards for co-op programs, could further serve to enhance industry needs, while increasing students' opportunities for practical experience.

Distance education is another area of cooperation considered in the paper. Cooperative approaches for distance education will become important because of its key role in enhancing accessibility of university and college programs to people in the Maritime region. Compatible technology and common systems would allow the development of a more coordinated approach in program delivery and thus improve accessibility through a cost effective process.

The last part of Section 4 addresses cooperation in literacy. Several examples of interprovincial collaboration in literacy are noted, including instructor training programs, curriculum development, and French translation services. Further cooperative activities in the field of adult literacy services would be

useful to enhance delivery and accessibility. Improved literacy in the Maritime population is essential for human resource development, personal fulfilment, economic growth and adaptation to new technology.

Section 5, which is the last section of the paper, consists of concluding comments and recommendations. University education and college education are addressed separately.

Concluding comments concerning university education, outline that over the past two years, the MPHEC, in conjunction with the Nova Scotia Council on Higher Education, has been undertaking a total review of the roles and planned capacities of the region's universities. While the Nova Scotia section of the work is complete, that on the rest of the region will not be ready for another six months. It is noted that a year from now, more specific recommendations concerning Maritime universities, and individual subjects should be possible based on the detailed reports.

A system of university co-operation has existed in the Maritimes since the establishment of the Maritime Provinces Higher Education Commission in 1974. This mechanism for co-operation should extend its efforts to provide the best possible return to the region's economy in terms of an educated regional workforce, using limited financial resources to the best possible effect. The following is the list of recommendations concerning university level education presented in the paper:

1. Each university in the region should be encouraged to specialise in its own particular area of expertise, and not attempt to offer all programs. Students wishing to take programs in the region should continue to be able to attend any of the specialised institutions for which they are qualified for admission regardless of which province it is offered in.

2. The universities in the region should work towards the complete transferability of credit between institutions, where the course that was taken is relevant to the program that a student is taking.

3. So that increased enrolments can be managed without dilution of program availability or quality, the universities in the region should co-operate in the delivery of their own specialised courses on different campuses, by distance education or other means.

4. A more equitable reward system should be established for both the originating and receiving institution, to encourage the implementation of recommendation 3.

5. A complete inventory of existing extension and distance education programs should be prepared, and assessment made to ensure that such programming can be made available as efficiently and extensively as possible.

6. Co-operative research and scholarship relating to the specific problems of the region, as well as pure academic research, should be encouraged.

7. Co-operative arrangements for purchasing between universities should be extended to all universities in the region, where practical and feasible.

8. The operation of computer networks and electronic communications between institutions in the region should be permitted to expand.

9. Detailed recommendations with respect to program modifications should be considered when the role and planned capacity statements for all three Provinces are available in 1992.

10. It is recommended that the Council of Maritime Premiers reconsider the MPHEC Report on Student Aid for the 1990s (November 1988) and also consider the Nova Scotia Student Aid Advisory Committee's Fourth Report (November 1990).

The second part of Section 5, presents concluding comments concerning college level education as well as recommendations for cooperation. It is noted that a ***Memorandum of Understanding Concerning a Program of Cooperation and Exchange in the Field of Higher Education*** is in the process of being developed by Nova Scotia and New Brunswick which will among other things, help to improve student access to community college programs offered in the two provinces. The Memorandum of Understanding has potential to provide more latitude in the types of services and activities in which provinces can formally cooperate. It is also noted that conceivably, there would be little or no net cost to provinces because a system of balanced exchange could be developed. It is concluded that the Memorandum could be expanded to accomplish several other cooperative initiatives discussed in this paper. While it is recognized that there have been some cooperative ventures at the college level, there are many issues which potentially could be addressed.

To address issues related to college level education, it is recommended that:

1. The Governments of Nova Scotia and New Brunswick proceed with the ***Memorandum of Understanding Concerning a Program of Co-operation and Exchanges in the Field of Higher Education***.

2. That appendices of the ***Memorandum of Understanding Concerning a Program of Co-operation and Exchanges in the Field of Higher Education*** incorporate, but not be limited to, the following areas of cooperation/exchange: program planning, curriculum development, student access to programs, professional development, distance education, and literacy services.

3. That, as soon as possible, Prince Edward Island explore the possiblity of becoming a party to the Memorandum of Understanding.

4. That a Maritime Provinces Community College (MPCC) Program Planning Committee be struck to (a) avoid unnecessary duplication of programs, (b) enhance accessibility to programs in the region (c) achieve more efficient mounting of programs, and (d) fulfil planning requirements under the Memorandum of Understanding (see #1 above).

5. That the MPCC Program Planning Committee include officials responsible for community college programming and officials responsible for labour market research and planning in respective provinces.

6. That the MPCC Program Planning Committee become the focal point for the regular exchange of labour market information among Maritime Provinces.

7. That Deputy Ministers responsible for major projects in the Maritime Provinces coordinate requests for labour market analysis of these projects on a Maritime basis, through requests to the MPCC Program Planning Committee.

8. That approaches for increased cooperation also be considered in the areas of: communication with industry, entrepreneurship training, cooperative education, and collaboration with universities in teaching development.

MARITIME COOPERATION IN EDUCATION AT THE POST-SECONDARY LEVEL

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1. INTRODUCTION

This paper is in response to the directive of the Council of Maritime Premiers, through Committee of the Maritime Forum, to prepare a discussion paper to identify opportunities for strategic cooperation in post-secondary education infrastructure as well as ways the post-secondary education sector can contribute to the competitiveness of the Maritime economy. Minute 79D-06 of the Council of Maritime Premiers noted the importance of infrastructure for a competitive economy, and that provincial governments have responsibilities for the provision of basic infrastructure, including education. The Minute referred to infrastructure as including the institutional arrangements which make capital functional, and the effectiveness of its use in the economic sector. It recognized that provincial governments have cooperated in many matters but that more integrated measures are required in education infrastructure in order to provide economies of scale, enhance levels of service and improve influence over decisions and behaviour by other levels of government, as well as other providers of infrastructure goods and services.

This discussion paper identifies opportunities for strategic cooperation in post-secondary education infrastructure together with approaches to enhance the competitive position of the Maritime economy.[1] It was compiled in collaboration by officials of the New Brunswick Department of Advanced Education and Job Training, Prince Edward Island Department of Education, Nova Scotia Department of Advanced Education and Job Training, the Nova Scotia Council on Higher Education, and the Maritime Provinces Higher Education Commission. The short time frame for the preparation of the paper precluded an external consultation process. It is intended that this discussion paper will form the basis for consultation, decisions and action in the post-secondary education sector.

Other Task Forces have been commissioned by the Council of Maritime Premiers to compile discussion papers relating to human resources. A parallel discussion paper on Maritime cooperation in education infrastructure for grades primary to twelve has also been undertaken. Another related issue which among other things is being examined by the Council of Maritime Premiers, concerns barriers to employment mobility involving differing occupational certification in the Maritimes. While the two aforementioned areas of study will not be examined here, critical areas of overlap will be given due consideration.

The task of examining areas for cooperation in post-secondary education requires clarification of the definition of post-secondary education. Post-secondary education has usually been understood to refer to university and college education which is pursued after obtaining a secondary school certificate. However, today people more often take different avenues after leaving the secondary school system. A person who left high school several years ago may be accepted to university as a mature student with or without holding a secondary school certificate. Students enter community college programs with various educational backgrounds; some hold secondary certificates and some do not. More and more adults are also returning to institutions of higher education to take programs in continuing education/upgrading, basic education and literacy. In a broad sense, all of these situations can be regarded as post-secondary education, because in each case, people are attending educational institutions at a different or higher level than secondary school and usually after attending secondary school.

The description of education also needs to reflect the changes in education/training which are occurring today due to our changing socio-economic environment. Because of changing economies, technology, and

[1] The focus of this paper is post-secondary education in the public sector. While it is recognized that the private sector is also involved in the delivery of post-secondary education in the Maritime Provinces, the majority of post-secondary education is within the public sector. Private sector education is also structured and governed differently and would require separate study in conjunction with the private sector.

skill requirements, people must be more flexible and prepared to learn new skills. The proportion of people who conclude studies in the educational system, whether high school, college or university, and later return to pursue additional education or training is increasing. In an examination of potential opportunities for cooperation in post-secondary education, it would be negligent to exclude the components of education which lie in the range between high school certification and university completion. Therefore, in this paper, post-secondary education is considered to include education and training delivered to youth and adults outside of the standard secondary school system.

To discuss infrastructure cooperation at the post-secondary level it is also necessary to discern what is encompassed in the reference to infrastructure. The established economic definition of infrastructure refers to roads, bridges, factories, etc. which are required for the foundation of an economy. However, in a general sense, the definition of the infrastructure of post-secondary education is not so different. Whether referring to a large economic system or an organization, infrastructure consists of the basic structures on which an enterprise is built such as facilities, services and equipment that are needed for it to function properly. The infrastructure of post-secondary education is therefore defined to include basic foundations required for it to function such as: institutions, instructors, students, equipment, administration, programs, services and funding.

Provincial governments in the Maritime provinces have effectively cooperated, and continue to cooperate, in post-secondary education infrastructure in many ways. Cooperation in post-secondary education has proven to be worthwhile on a broad basis and is worth expanding. Cooperation among educational institutions has the potential to produce greater achievements in education, improve methods of delivery, and reduce costs for some activities. Overall, improved efficiency and effectiveness in post-secondary education can be achieved through cooperation. In turn this is beneficial for the economy, because when human resource development is achieved more efficiently, improved competitiveness and productivity result.

Cooperation in post-secondary education in the Maritimes exists in many venues. Much cooperation is informal and exists among people who discuss their work and collaborate in informal networks. There are important benefits in this type of cooperation which are worth building on. More formal cooperation also takes place through organizations which exist to coordinate and promote the activities of post-secondary institutions within provinces and regions as well as nationally. Examples at the national level include the Association of Universities and Colleges of Canada, the Association of Canadian Community Colleges, the Canadian Association of University Business Officers, the Association of Registrars of the Universities and Colleges of Canada, the Canadian Association of College and University Student Services, the Canadian Association of Deans of Graduate Schools, the Canadian Association for Continuing Education and the Canadian Association of Research Libraries. In most cases, counterparts to the national associations exist also at the regional level. For example, in the Atlantic region, we find the Association of Atlantic Universities, the Atlantic Association of University Business Officers, the Atlantic Association of College and University Student Services, the Atlantic Association for Continuing University Education and the Association of Atlantic Universities Librarians Council. There are many more associations besides these. Further, formal governmental cooperation exists in the Maritime provinces through the Maritime Provinces Higher Education Commission.

To consider, further areas of cooperation in post-secondary education, it is imperative to understand the structure and composition of the educational systems in the Maritimes, as well as the background and function of the Maritime Provinces Higher Education Commission. A description of these systems follows.

2. BACKGROUND ON MARITIME PROVINCES POST-SECONDARY EDUCATIONAL SYSTEMS

A. COLLEGE LEVEL EDUCATION IN THE MARITIME PROVINCES

The structure of college level education has similarities in the Maritime Provinces. Appendix 1 contains a tabular summary of college education systems in New Brunswick, Nova Scotia and Prince Edward Island. A description for each province is provided below.

i) New Brunswick

Advanced Education and Training is the government department responsible for providing human resource development opportunities for the citizens of New Brunswick. This entails offering, coordinating or assigning to other departments all publicly funded education programs designed to serve the adults of New Brunswick. The Department's objectives are to provide educational opportunities, including basic education and skills acquisition, in response to individual and employer needs, as well as offering programs which are responsive to the needs of a highly developed society.

Post-secondary non-university education in New Brunswick is carried out by a network of institutions located in various communities throughout the province. Some are multi-program in nature, whereas others are single-program oriented. Programs offered through the post-secondary non-university institutions are intended for employment purposes and are not generally considered university transfer programs. However, many graduates of these institutions pursue further education objectives at universities and often the universities concerned grant credit for most of the studies completed at post-secondary non-university institutions.

Nine community colleges, each with permanent facilities in a different area of the province, offer multiplicity of programs on a full-time or part-time basis, both on and off campus. These institutions have a specific linguistic character, either English or French, and the community college network provides services based on a concept of linguistic duality. Thus, five community colleges report directly to the Assistant Deputy Minister of Educational Services - English, and four community colleges report directly to the Assistant Deputy Minister of Educational Services - French.

New Brunswick has five schools of nursing which offer a single 100 week diploma nursing program. Two schools of nursing offer the nursing program in French only, two in English only, and one school offers the program in both languages. The schools of nursing report directly to boards of directors, which, in turn, are responsible to the Minister. The Department of Advanced Education and Training reviews the financial requirements of these institutions, which are included within its regular budget submission to government.

Located in Fredericton, the New Brunswick Craft School and the Language Training Centre are two additional institutions which are considered single-program in nature. The Craft School offer a three-year craft program in a number of disciplines. The Language Training Centre provides second language training to provincial civil servants. The New Brunswick Craft School and the Language Training Centre report to the Assistant Deputy Minister of Education Services - English.

The Maritime Forest Ranger School is a regional institution, which operates under a board of directors. The School offers a one-year forest ranger program to citizens of the three Maritime provinces (Prince Edward Island, Nova Scotia and New Brunswick). Unlike other post-secondary non-university institutions, the School reports to government via the Maritime Provinces Higher Education Commission.

The School of Fisheries, located in Caraquet, operates as a line branch of the Department of Fisheries and Aquaculture. Courses offered at Caraquet and off-campus are primarily in seamanship, fishing techniques, marine technology, aquaculture and safety. These training programs, whether regular, short-term or specialized, address the practical needs of fisherman and others involved in the fishing industry in New Brunswick.

Literacy also forms part of college level education. Programs in literacy training have been available since the early 70s to help meet the needs of New Brunswickers. Cooperative literacy training ventures between the volunteer sector and government have also existed for over a decade. However, due to heightened awareness about literacy in recent years, educational opportunities for adults in need have greatly expanded. Awareness of the challenge has increased through all levels of society. This has been translated into new initiatives reaching into a variety of new fields.

The Government's initiatives in literacy have been primarily driven and coordinated by the Department of Advanced Education and Training (DAET). As the funds available for literacy training have increased each year, the number of adults with access to literacy training has also increased. As a result, thousands of New Brunswickers are participating every year in some form of academic upgrading through the DAET and the volunteer sector. Depending upon the level of training sought, these individuals choose from a variety of training programs ranging along the literacy skills continuum.

Recognizing the need to reach disadvantaged young people outside the institutional setting, New Brunswick also established a number of store-front learning centres in 1989, through the Youth Strategy Program. The target population in this case is the 15-24 age group who have had difficulty making the transaction from work to school.

In New Brunswick, literacy instruction of non-readers or adults reading at low levels is offered predominately by volunteer tutors, in association with local literacy councils. The literacy tutoring provided by the volunteer sector can bring adults to the grade 3 level of competency. The volunteer and the adult learner meet about once a week, in surroundings that encourage the intimacy of this tutoring relationship. This arrangement can be most desirable for the learner. However, while this commitment of volunteers is desirable, it must also be supported and encouraged. To do this, full-time literacy coordinators work from each of the nine community colleges in the province. Their task is to work with the literacy councils in the community to help in the recruitment and training of tutors, in the establishment of new literacy councils and in attracting students for tutoring.

In the workplace there is ample evidence that there is a major literacy problem, especially in the smaller firms. Industry and employee associations have intensified their involvement during the last while. They have initiated a number of programs. An example is the workplace literacy contract in Kedgewick that the Fraser company signed with DAET. There is good will on behalf of both groups and they are ready to participate in any multi-partner initiative on literacy.

Literacy programs which find their roots at the community level are also appearing in the province. The Saint John Learning Exchange is an example of the kind of private non-profit organization which addresses the literacy problem and attempts to find methods suitable for those citizens with employment or social related needs. The most recent and innovative approach has been the establishment of community literacy classes. These classes are established in communities and are available to anyone in need. They are administered by community groups and jointly funded by the community and by both orders of government. DAET provides the curriculum and trains the trainers. The local employers are cooperating by encouraging their employees to participate by providing funding. The Province of New Brunswick intends to establish 100 classes over the next four years.

ii) **Nova Scotia**

In Nova Scotia, college level education is delivered primarily through the Nova Scotia Community College system under the Department of Advanced Education and Job Training. The Community College system accounts for the majority of students in the public education sector of the non-university programs. Through the 18 campuses that make up its community college system, the Nova Scotia Department of Advanced Education and Job Training provides about 130 different programs in trades, technical, technological and applied arts fields. Programs are designed to assist trainees to acquire the skills and knowledge, as well as develop the attitudes and habits, necessary to enter and make progress in their chosen occupations.

Entrance requirements vary for community college programs. The academic criteria ranges from grade 10 to grade 12. However, other factors are usually taken into account including work experience, aptitude, ability and interest. In practice, most students who are accepted into community college programs have grade 12. The Community College system serves both students direct from high school and adults of various backgrounds. The average age of graduates is about 23 years. Full-time programs are one or two years in length, and upon successful completion graduates are awarded a certificate or diploma. Students who do not have all academic requirements to enter core community college programs can take basic education and upgrading courses of 4-20 weeks duration to assist them in obtaining the necessary prerequisites.

Community college programs are mostly provincially funded. Tuition fees were introduced for students for the first time in September, 1991. Federal funding through Employment and Immigration Canada is involved in seat purchases for specific programs. In addition, a number of programs are purchased by industry associations which often receive funding from Employment and Immigration Canada.

A number of skill upgrading and basic education courses are also offered through the Community College system and school boards. These courses range in length from a few days to a few months. The admission criteria for skill upgrading is generally occupational experience and/or certification in a respective field. In the case of basic education, students are usually referred to the required educational level through counselling. Upgrading and basic education courses serve various types of students including youth, adults and students who require academic upgrading to access core college programs.

College level education is also delivered in institutions associated with the Nova Scotia Community College. The University College of Cape Breton provides a range of college programs in the areas of business, applied arts and technology. In addition, Memorial Composite School in Sydney delivers a variety of occupational training programs.

Specialized education and training is also provided in a number of institutions outside of the Nova Scotia Community College system. Nursing and health technology programs are offered in several hospitals across the province. As well, marine and coast guard programs are offered through the Nova School of Fisheries and the Canadian Coast Guard College.

Adult literacy is another area of education which is delivered in Nova Scotia. The Nova Scotia Department of Advanced Education and Job Training has the lead role for adult literacy programs and services in the province.

The Literacy Division of the Department was established in 1988. It is dedicated to: 1) developing an awareness of adult literacy, basic education and academic upgrading in the province; 2) providing leadership in the development of literacy and basic education services; 3) providing professional

development to community agencies, volunteer organizations and institutions involved in adult literacy; and, 4) establishing strong local, regional and provincial literacy networks.

Literacy programs and services are delivered in a variety of settings. Within the Nova Scotia Community College system, literacy services are available in campuses throughout the province. Programs are also delivered through workplace upgrading, which involves a partnership between management, unions and employees to create programs that strengthen the job-related basic skills of workers. In communities, support is provided to community-based literacy programs by providing free learner materials, professional development and regional resource centres. Literacy facilitators work in the five regions of Nova Scotia and with the Black, Micmac and Acadian communities.

Industry specific training is also supported by the Province of Nova Scotia. Support for business training is available through the Nova Scotia Department of Industry, Trade and Technology's Technology Advancement Program. The program provides funding for non-capital assistance to improve the use of technology in industry, which includes subsidies for training programs. The Nova Scotia Department of Industry, Trade and Technology also sponsors a marketing program for business, which is delivered by Dalhousie University at the World Trade and Convention Centre in Halifax.

iii) Prince Edward Island

In Prince Edward Island, there is one community college - Holland College, which serves the entire Province with main campuses at Charlottetown and Summerside and some facilities in four other communities.

The College was established in 1969 by an act of the Legislature, The Holland College Act. The Act provides that the College is a body Corporate governed, managed and controlled by a Board of Governors consisting of:

- two representatives elected from and by the student body
- two representatives from the business and industrial community appointed by the Lieutenant Governor in Council
- three representatives appointed by the Lieutenant Governor in Council, from employees, below the rank of deputy minister, of departments or agencies of government or from teachers employed by a regional school board
- four representatives appointed by the Lieutenant Governor in Council from a list provided by the above named representatives
- the President of the College, and the President of the University of Prince Edward Island.

The stated objectives of the College are "...to provide a broad range of educational opportunities, particularly in the fields of applied arts and technology, vocational training and adult education.

The College offers post secondary programs in Business, Creative Arts, Health Sciences, Hospitality, Technology, Renewable Resources and Justice Training. Adult Vocational Programs are offered in Marine and Forestry, Adult Education, Mechanical Trades, Construction Trades, Service Occupations and Continuing Education.

The College has also, since 1975, offered a vocational high school program in cooperation with the regional school boards whereby high school students spend half time at their high school and half time at the College.

The post secondary section of the College is funded by the Province through the Maritime Provinces Higher Education Commission which reviews program offerings and budgets and makes recommendations to the Province.

Adult programs are funded either by the Department of Industry by the purchase of Canada Employment and Immigration Commission places or on a user pay basis.

The College operates the Atlantic Police Academy which was established by the four Atlantic Provinces to provide a regional residential police training centre. This section of the College operation is funded by the four Departments of Justice with a certain number of places guaranteed for each province depending on their agreed share of the funding formula.

The Culinary Institute of Canada operates out of the Holland College facilities and provides professional level training for prospective chefs. The program draws students from all parts of Canada and is operated on a user pay basis.

The College program provides for extensive on-the-job training with placements being made not only in Prince Edward Island but throughout Atlantic Canada.

The Prince Edward Island Department of Industry has the lead role for adult literacy programs and services in the Province. In 1990 the Provincial Literacy Secretariat was established within the Adult Continuing Education Section to carry out the administration of the Federal/Provincial Literacy Initiatives grants program as well as provincial funding to voluntary literacy councils. The Secretariat was also established in order to maintain contact with other literacy organizations within the province and develop and administer literacy projects.

The Prince Edward Island Department of Industry delivers literacy programs and services through the following organizations:

1. Holland College provides both daytime and evening academic upgrading courses for the Province in a variety of locations.

2. Five Regional English Literacy groups provide one-to-one tutoring using Laubach Literacy Canada materials and techniques.

3. The St. Thomas Aquinas Society provides a French literacy program throughout the Province having received Federal and Provincial project support in the past.

4. The Federal/Provincial Literacy Initiates Fund provides support for groups to deliver eligible projects that address literacy needs in the Province.

5. The PEI Literacy Alliance provides a forum for government, community organizations and training institutions to work co-operatively in addressing literacy issues and needs.

6. Literacy organizations are provided with copying and printing services free of charge by the Department.

B. UNIVERSITY EDUCATION IN THE MARITIME PROVINCES

i) Background

There are eighteen universities in the Maritime Provinces, four in New Brunswick, one in Prince Edward Island, and thirteen in Nova Scotia. Activities at all eighteen, together with three non-university post-secondary institutions are co-ordinated through the Maritime Provinces Higher Education Commission. The non-university institutions are the Maritime Forest Ranger School in New Brunswick, the Nova Scotia College of Geographic Sciences, and Holland College in Prince Edward Island. A listing of the institutions relating to the MPHEC is Contained in Appendix 2. This listing also shows the full-time and part-time enrolments at each institution, in both university and community college level programs. Part-time enrolments are expressed as full time enrolment equivalents, based on an equivalence of 5 full courses to one full-time equivalent.

The full time equivalent for each institution by level of study, as well as the weighted full time equivalents are provided in Appendix 3. The Weighted full time equivalent takes into account the different cost of providing different types of programs. In both Appendices 2 and 3, the different campuses of l'Université de Moncton, and the University of New Brunswick are shown separately.

ii) The Universities in the Maritime Provinces

Universities in the three provinces of New Brunswick, Nova Scotia and Prince Edward Island have a long history in the Canadian context. Many of the universities in the region were founded in the latter part of the 18th century and the early part of the 19th century. These institutions were established by the early settlers, religious denominations, professional groups or governments.

Universities in the region have undergone great change over the past 30 years. During this period governments have assumed a major responsibility for the funding of the universities to allow them to accommodate the tremendous enrolment and program pressures. These have resulted from expansion and change in the economy, scientific and technological advancements, rising expectations among the public and demographic factors. Not only did the nature of the universities change quite markedly during this period but some additional degree granting institutions were established as well.

The long history of university education in the Maritime Provinces has resulted in a relatively large number of diverse universities spread geographically throughout the region. The primary focus of most of the institutions, in terms of programs of instruction, is at the undergraduate level with graduate programming concentrated at several institutions. The universities exist by virtue of acts of their respective provincial legislatures and for the most part, operate under private boards.

Because of geography and a small population base, a regional dimension has long existed concerning universities in the Maritime Provinces. Considerable interprovincial flows of students have occurred traditionally. Governments have co-operated to expand the range of programs and to share related costs from the early days of significant government involvement in university financing. A regional approach to the planning and development of universities was made more formal and ongoing 17 years ago with the establishment of the Maritime Provinces Higher Education Commission in 1974. It was established to assist the provinces and institutions in achieving a more efficient and effective utilisation of resources.

The general objectives associated with provincial government support of universities are: to provide university level programs of instruction that are accessible to residents of the Maritime Provinces having the capability to participate, and to those of other provinces and countries when space exists; to provide the infrastructure for basic and applied research; and to provide a range of community, cultural,

consultative and recreational services that are available as a result of the expertise and resources available within the universities.

The remainder of this section describes the university universe in each of the Maritime Provinces.

University Education in Prince Edward Island

In Prince Edward Island the mandate for the delivery of university education rests with the University of Prince Edward Island that is the Province's single university. The Minister of Education is responsible for university education and the University of Prince Edward Island relates to the Minister and the provincial government through the Maritime Provinces Higher Education Commission (MPHEC). In the case of Prince Edward Island the MPHEC replaced the Prince Edward Island Commission on Post-Secondary Education that had been established in 1968 to serve as a buffer between the provincial government and its post-secondary education institutions.

The University of Prince Edward Island operates under a Board of Governors as empowered by the University's Act. The Government of Prince Edward Island provides annual operating grants to the University that represent approximately 85% of total university general operating revenue. Tuition fees represent most of the balance being nearly 15% of general operating revenue. The provincial operating grants are determined each year after considering funding recommendations submitted by the MPHEC.

A significant amount of Prince Edward Island's annual operating budget for university education, approximately 18%, is in the form of inter-provincial transfers to New Brunswick and Nova Scotia. This is to pay for students from Prince Edward Island enroled in programs in those provinces that are not available in the Province. These transfers are pursuant to a cost-sharing arrangement that exists among the Maritime provinces.

The Government also provides capital assistance to the University. Capital projects are reviewed by the MPHEC and normally financed through loans guaranteed by the provincial government and other revenue sources that may be available to the University. The provincial government subsequently provides capital grants to retire the guaranteed loans over a several year period.

The primary objective of the provincial funding in respect of university education is to provide accessibility for the residents of the Province to university level education in the Province, when feasible, and in other provinces when programs cannot feasibly be offered in PEI. The Province also wishes to make the programs offered by the University of Prince Edward Island available to the residents of other provinces and countries when places are available. Additionally, the Province through its University, expects to have a resource centre with the capability of carrying out pure and applied research and providing a variety of community, cultural and professional services available to the entire Island.

The University of Prince Edward Island currently has a full-time enrolment of approximately 1,900 students and provides courses to another 700 students on a part-time basis.

The University offers undergraduate programs in the humanities and social sciences, administration, mathematics and the physical sciences, engineering and applied sciences (junior years), education and music. In addition the university has a faculty of veterinary medicine that offers programs to the Masters level. Any changes in program offerings must be submitted to the Maritime Provinces Higher Education Commission for approval for funding purposes.

The University operates a two semester academic year. Programs are available to students on a full and part-time basis during the academic year with inter-sessions and summer sessions also being available to part-time students. Undergraduate programs are generally of four-years duration for full-time students.

Normal minimum admission requirements to university programs of study consist of completion of the public school grade 12 academic program with a 60% average and successful completion of specified university preparatory courses. The competition for places in some programs results in the qualification to ensure admission being above the minimum. The University will consider for admission mature students who lack the normal requirements but demonstrate the ability to pursue university programmes.

University Education in New Brunswick

The Province of New Brunswick's university system consists of four universities - Mount Allison University, St. Thomas University, l'Université de Moncton and the University of New Brunswick. The current structure for university education in the Province was put in place to facilitate the development that has occurred over the past quarter-century to meet the needs of the Province. A Royal Commission established in 1961 to review higher education in New Brunswick resulted in significant reorganisation over the subsequent several years. A second campus of the University of New Brunswick was established at Saint John. St. Thomas University was relocated to the University of New Brunswick's Fredericton campus. The Université de Moncton was established as a French language university with affiliates that eventually became campuses at Edmundston and Shippagan. Mount Allison University's role as a small liberal arts and science institution was confirmed. This Royal Commission not only defined the New Brunswick university system but also put in place the bases for university funding and relationship with the provincial government the fundamentals of which are still present today.

The universities exist by virtue of acts of their respective provincial legislatures and operate under private boards. The universities relate to the provincial government through the Maritime Provinces Higher Education Commission (MPHEC). The MPHEC succeeded a similar provincial commission that had been established in 1967 to serve as a buffer agency between the government and universities out of respect for academic freedom and the benefits of autonomous universities. The Commission provides advice to the provincial governments on the post-secondary needs of the region and level of funding required. In so doing the MPHEC requires that the universities submit for approval for funding any new programs to be offered.

The universities are financed primarily from government grants, tuition fees, contributions from the private sector and endowment income. With government financing much of the significant expansion that occurred in the 1960s and 1970s, the universities in New Brunswick as those in other provinces, became very dependant on government grants. In New Brunswick approximately 75% of the universities' general operating income is from government, 20% from tuition fees and the balance from the other sources.

Provincial government financing of university education is in the form of operating and capital grants to the universities, a student aid program and the funding of research or other projects in areas of importance to the Government.

Operating grants are allocated to universities by formula. Approximately 95% of funding is in the form of unrestricted grants provided to the universities in two components. The first are flat grants that represent 75% of the grant and which increase at a uniform rate from year to year for all universities, and Enrolment Grants that are calculated for each university using the latest actual three year average enrolments. Universities receive approximately 5% of operating assistance through restricted grants that

are earmarked for equipment, renovations and library volumes and which are allocated in proportion to enrolments and physical plant size of the respective universities.

The general objectives associated with provincial government support of universities are: to provide university level programs of instruction that are accessible to residents of the Maritime Provinces having the capability to participate and to those of other provinces and countries when space exists; to provide the infrastructure for basic and applied research; and to provide a range of community, cultural, consultative and recreational services that are available as a result of the expertise and resources available within the universities.

New Brunswick's universities are relatively small with full-time enrolments at the various campuses ranging in approximate terms from 300 to 7,000 students. These institutions offer a wide range of undergraduate and first professional degree programs in both Official Languages. Programs at Mount Allison University, St. Thomas University and the University of New Brunswick are offered in English, while the Université de Moncton provides programs in the French language. Graduate programming is less developed particularly at the doctoral level with only a limited range of offerings being available.

New Brunswick's universities operate generally on a two semester academic year, although an increasing number of co-operative work-study programs are being introduced resulting in some programs operating year-round in three semesters. Programs are available to students on a full and part-time basis during the academic year with inter-sessions and summer sessions also being available to part-time students at most of the campuses. Degree-credit courses are also available to part-time students at remote locations on a limited basis through traditional methods and teleconferencing and television broadcasting. Most undergraduate programs are of four-years duration for full-time students with some professional programs requiring five years under normal circumstances.

Programs at most universities require successful completion of grade 12 of public schooling with a 60% average and no mark below 50% in specified university preparatory courses. The competition for places in some programs results in the cut-off for admission being above the specified minimum requirement. The universities will consider for admission mature students who lack the normal academic requirements but demonstrate the ability to pursue university studies.

Advanced standing is provided to graduates of applied arts and technology programs in some university programs. This arrangement is generally on an individual application basis as no formal university transfer programs exist.

Because of geography and a small population base, a regional dimension has long existed regarding universities in the Maritime Provinces. Considerable interprovincial flows of students have occurred traditionally. Governments have co-operated to expand the range of programs and to share related costs from the early days of significant government involvement in university financing. As previously noted, the establishment of the Maritime Provinces Higher Education Commission developed a more formal and ongoing regional approach to the planning and development of universities.

New Brunswick has relied extensively on inter-provincial arrangements to enable its residents to have access to programs of study that can not feasibly be offered within the Province. These arrangements consist of participation in funding regional programs with Nova Scotia and Prince Edward Island, and agreements for specific programs with Newfoundland, Ontario and Quebec the latter of which provides access to programs mainly in the health professions for francophone students.

Nova Scotia Universities

In Nova Scotia, government responsibility for university education rests with the Department of Advanced Education and Job Training through the Nova Scotia Council on Higher Education.

University education is offered at thirteen degree granting institutions in Nova Scotia, seven of which are located in metropolitan Halifax with the balance spread geographically throughout the province.

Six of these universities (the University of King's College, Saint Mary's University, Mount Saint Vincent, Acadia, Saint Francis Xavier and the Université Sainte-Anne) offer a comprehensive range of programs primarily at the undergraduate level, although most offer graduate programming to the master's level, particularly in arts, science and education and, in one instance, (Saint Mary's) in business administration.

Included among the six are two rather special cases. The "Université Sainte-Anne" is a small French-language university offering undergraduate arts and science programs. The University of King's College, the oldest established university in the province, operates in affiliation with Dalhousie University, with the result that students registered at King's have available to them the exceptionally wide range of programming available through Dalhousie, as well as particular access to the King's specialities in journalism and a broadly based comprehensive foundation program.

Five of the institutions (the Atlantic School of Theology, the Nova Scotia College of Art and Design, the Nova Scotia Teachers College, the Nova Scotia Agricultural College and the Technical University of Nova Scotia) specialise in particular fields. Among them, the Technical University of Nova Scotia provides programming to the Ph.D. level in Engineering and allied specialities.

Unique in Nova Scotia is the University College of Cape Breton that offers academic degrees in arts and science from the same campus as its technology and highly skilled technical training programs.

Finally, Dalhousie University may be described as a full service university, offering a wide range of programs through the graduate level, including the Ph.D., and major professional schools.

The range and diversity of the system is perhaps dramatically indicated by the fact that the number of full-time students registered varies from slightly over three hundred at "Université Sainte-Anne" to more than 8,500 at Dalhousie.

Type of Study Programs

Most of Nova Scotia's universities operate on a two semester academic year. However, one institution, the Nova Scotia College of Art and Design operates a trimester system and several others are now involved in co-operative work study programs that have study periods staggered throughout the year.

Programs are available to students on a full and part-time basis during the academic year. Intersessions and summer sessions are also available to both full and part-time students at most of the institutions.

Several of the universities make programs available at remote locations, sometimes in co-operation with community college campuses and with local adult education groups. It is intended and expected that this type of programming will become more common and more general as the community college system develops.

Distance education through television and teleconferencing is now available in a number of disciplines. It is intended that there will be a major expansion of this type of programming both in the universities and

in the community college campuses as the Nova Scotia Communications Agency, established by legislation this spring, takes the lead in this field.

Most undergraduate programs are of four years duration for full-time students and, although some universities still offer a three-year arts program, the general thrust is toward a common four-year degree program, with some professional programs requiring five years of study under normal circumstances. University programs generally require successful completion of Grade 12 in the public school system with a 60% average and no mark below 50% in specified university preparatory courses. Nova Scotia Grade 12 is considered to be the equivalent of senior matriculation but some universities admit students, who have completed Grade 11 with a minimum average of 65% and no mark below 50% in specified preparatory courses, to certain programs. As elsewhere, however, entrance requirements are trending upwards, and certain institutions already require a 70% average for admission to some programs. The competition for places in some programs results in the qualification that will ensure admission being substantially above these minimums.

Universities regularly consider for admission mature students who lack the standard requirements but who demonstrate the ability to pursue university programs.

In recent years, there has been an increasing effort to modify regular admission requirements to help compensate visible minority and other disadvantages groups to overcome the particular difficulties they face in gaining access to a full educational opportunity. In some instances, perhaps notably the transitional one-year program at Dalhousie University, special pre-university programs are provided to enable certain visible minority students to achieve a level of performance equivalent to university entrance requirements as well as to prepare them generally for regular university studies.

Advanced standing is provided to graduates of applied arts and technology programs in some university programs. This arrangement has generally been on an individual application basis in the past, as no formal university transfer programs general to the province have existed. As the province implements a new community college system, formalised transfer arrangements between universities and community college campuses are being developed and it is expected and intended that such transference will become more common and more general.

Regional Context

It is particularly important to an understanding of the university universe in Nova Scotia to be aware of the regional context within which the university system operates and the particular relationship of Nova Scotia universities to provides beyond the Maritime region.

Because of the small population base in the Maritime provinces and the proximity of all parts of the three provinces to all the region's post-secondary institutions, there is a very considerable flow of students across the provincial boundaries and, in particular, from the other provinces to institutions in Nova Scotia, especially Dalhousie, which serves as the regional centre for education and training in medicine and the health professions generally. Particularly since the universities began to become increasingly dependent upon government financial support, the governments of the three provinces have co-operated in the provision of programs and in the sharing of the related costs. This regional approach to the planning and development of university programs was formalised fifteen years ago with the establishment of the Maritime Provinces Higher Education Commission to assist the provinces and institutions in achieving a more efficient and effective utilisation of resources. While this regional dimension continues and must continue, the recent establishment of the Nova Scotia Council on Higher Education clearly signals a recognised need to meet challenges and deal with problems that are not dealt with on a regional basis. The Nova Scotia Council on Higher Education has major responsibilities to develop, together with the

universities, a long range plan for the development of a co-ordinated system of university education within Nova Scotia that will meet the social, economic and educational objectives of the province.

In addition to the substantial flow of students from within the region to Nova Scotia universities, there is also a flow of students from other provinces, similarly exceeding the flow of Nova Scotia students to other parts of the country. The result is that Nova Scotia has more university students per capita than any other jurisdiction in Canada. This has considerable significance, particularly in relation to university finance, considering the fact that Government of Canada support through EPF is based upon total population rather than the number of post-secondary students.

C. Student Aid in the Maritime Provinces

In addition to other forms of funding, federal and provincial governments further contribute to university education through their student aid programs.

The philosophy of the student aid program (and compatible provincial programs) in Canada, as summarized by the MPHEC, states that the Canada Student Loans program operates with the principle that the individual student and his/her parents or immediate family have primary responsibility for financing post-secondary education with financial assistance being available to supplement student and family resources.

The Canada Student Loans (CSL) program was established in 1964 under the Canada Student Loans Act, and is the Federal Government's largest program of assistance to students. Administered by the Student Assistance Directorate in the Department of the Secretary of State, the CSL program provides financial assistance in the form of guaranteed loans to post-secondary students who have demonstrated financial need. The CSL program operates with the principle that the individual student and his/her parents or immediate family have primary responsibility for financing post-secondary education with Student Aid being available to supplement student and family resources. This is to ensure that all academically qualified students have accessibility to post-secondary education without excessive financial hardship.

Generally, provincial student assistance programs consist of a combination of the federal CSL program with Provincial Student Aid programs that vary considerably by province. The Provincial programs are either in the form of a loan program apart from the federal program as in the case of Quebec, a loan program to supplement the federal program, and/or a bursary program. As a result, post-secondary students from each province have available to them a unique student aid package. Several provinces from Central and Western parts of Canada have instituted loan programs to supplement the CSL as the federal CSL was found to be inadequate in meeting the current financial needs of students.

Prince Edward Island

The provincial Student Aid program in Prince Edward Island consists of the Canada Student Loan Program and a Provincial Bursary Program. The two components are integrated with the first $2,600 of need being CSL, the next $2,200 of need is P.E.I. Bursary with the balance of need to the maximum allowable (up to $760) being CSL.

New Brunswick

New Brunswick's Student Aid program consists primarily of a bursary program that supplements the CSL program. On the basis of a needs-assessment that is integrated with that used for the CSL program, university students are able to receive up to $2,700 in bursary assistance plus up to $3,360 through the CSL program per academic year.

Nova Scotia

The Student Aid program in Nova Scotia is also a bursary program that is needs-based and integrated with the CSL program. In a normal academic year students are able to receive up to $2,900 through CSL assistance. This is followed by up to $2,000 in bursary assistance with any further assessed need up to $460 being available by way of additional CSL assistance.

Issues on Maritime Cooperation

In the past, many options have been discussed to improve the effectiveness of the Student Aid program. One alternative promoting discussion, involved the merits of having a common student assistance program for the Maritime Provinces as one unit. While the importance for each government to be able to reflect its own political philosophy and values in its program has been recognized, there was and is a great need for coordination at both the policy and administration levels among the three provinces. This would help to ensure a reasonable degree of uniformity, both in the assessment of students' needs and in other administrative practices.

This issue surrounding Maritime cooperation was more recently raised in the MPHEC's report, Student Aid for the 1990s, in November of 1988 and echoed in the Fourth Report of the Nova Scotia Student Aid Ministerial Advisory Committee (NSSAAC), dated November 1990. A framework for the development of a cooperative Student Aid program for the 1990s in the Maritime Provinces was outlined in these reports. Highlights of the program would include (a) undertaking a periodic assessment and adjustment of student costs and cost allowances to ensure that assistance levels are adequate; (b) keeping administrative control to a minimum; (c) an incentive-based program to encourage participation, avoidance of debt, and monetary contributions from parents and family through the provision of tax credits; and, (d) the implementation of a loan repayment system be implemented which could be integrated into the income tax collection, thereby reducing debt load considerations.

Other recommendations regarding Maritime cooperation raised in the MPHEC Report include (1) Student Aid provided by governments in the region should be fully portable throughout the Maritime Provinces and outside the region for programs not offered within the region; (2) Student Aid directors from the three Maritime Provinces meet regularly (at least semi-annually) to eliminate unnecessary variations in the three provincial Student Aid programs; and finally, (3) the Maritime Provincial Governments attempt to secure a Federal-Provincial agreement on the provision of student assistance.

The NSSAAC endorsed the intent and substance of each of these recommendations and offered some rational for its endorsement. On the issue of Maritime cooperation, the NSSAAC also recommended that its Fourth Report be submitted to the Council of Maritime Premiers so that the Council may approach the Federal Government with a proposal following the structure above.

D. THE MARITIME PROVINCES HIGHER EDUCATION COMMISSION

As indicated previously, the MPHEC was established by the Council of Maritime Premiers in 1974. The declared objective was as follows:

> "To assist the Provinces and the institutions in attaining a more efficient and effective utilisation and allocation of resources in the field of higher education in the region."

While considerable inter-provincial co-operation already existed, the Commission set out to formalise and extend this co-operation, during a period of steady growth in both enrolment and the cost of university programs.

The Commission was originally established with a Chairman and a membership of fifteen, of whom five were from the public at large, and five were senior public officials all appointed by the Council of Maritime Premiers, and five appointed on the recommendation of the university sector. At least one member from each category had to be appointed from each of the three Maritime provinces. The legislation was amended in 1986 to allow for nineteen members in addition to the Chairman, increasing to 6 the minimum number in each category. As of September 1991 there are, in addition to the Chairman, four members from Prince Edward Island, six from New Brunswick, and nine from Nova Scotia. A copy of the legislation establishing the Commission is provided in Appendix 4.

From the beginning, the Commission has actively pursued the role provided for by its legislation. It has, in conjunction with the Association of Atlantic Universities, reviewed all new program proposals put forward by the institutions in its mandate. It has made annual recommendations to the Council of Maritime Premiers for funding of universities. It has carried out reviews of specific subject areas, to assess the need for additional programming, and to arrange for students to go outside the region, when it is not feasible to provide programming locally. It has also required universities to provide plans for three and five year periods to clarify future needs. It has prepared inventories of space at institutions, and has also assessed the needs for maintenance, and new capital investment.

i) Program Review

The process of new program review is a fundamental component of the promotion of inter-university co-operation. Any proposal for a new program, after internal university approval, is circulated to interested institutions for comment, and then considered by the joint committee of the MPHEC and the AAU. The program is evaluated on the basis of need, as well as on the basis of content. It will be approved, and the students taking it counted for funding purposes, only if the program is necessary for the region, and does not unnecessarily duplicate existing programs. Since the beginning of this process, there have been 141 applications for new or modified programs which have been considered.

Several major subject reviews have also been carried out by the Commission, to determine the necessity of new programs in specific areas. Typical illustrations of this are the Physical Education, Recreation and Related Subjects Study; Study for the Establishment of a School of Veterinary Medicine in the Atlantic Region; Research Report on Engineering Education; and the Legal Education Study.

Many of these studies have had significant outcomes, for the region, through limiting the creation of new programs in Law in English, and Engineering, or in setting up new ones, as in the case of Law at Moncton, and the Atlantic Veterinary College.

ii) **Regional Funding**

When the Commission was first established, the contribution of each province to University Education was based on population and the number of students that each province had participating in University education. In 1978 the Commission recommended to the Council of Maritime Premiers that the funding basis should change. This would result in transfers of funding between provinces in respect of students who attended programs in one of the other provinces because the program was not available in their home province. Such programs are referred to as regional programs. This has had significant consequences, as there are over 250 programs that are offered in only one or two of the provinces, which can be accessed by students from provinces without them. The net impact of the student flow in 1989-90 was that Prince Edward Island and New Brunswick contributed $9,117,000 to the Province of Nova Scotia in consideration of that academic year.

While French language education at the University level has developed significantly since the formation of the Commission, the establishment of programs in the health sector, other than in nursing, has not been considered feasible. For this reason there are a number of arrangements with Universities in Quebec for funding francophone students, primarily coming from New Brunswick.

iii) **Regional Planning**

Since its establishment the Commission has requested the filing of three year plans from universities on a continuous revolving basis, to ensure the co-ordination of activities. In 1981 the Commission published "As we see ourselves" a descriptive document on the role of each of the region's universities. In 1989 the Commission started a process of seeking Role and Planned Capacity Statements. At the time of writing, this process has been completed in Nova Scotia and is underway in New Brunswick and Prince Edward Island. The outcome of this process will establish the future plans and capacity of all the region's universities, and will lead to even greater harmonisation of programs across the three Provinces, in the context of present day trends in the economy and student enrolment.

iv) **Extension and Distance Education**

Extension and distance education will play an increasingly important role in the region in the future. Further development of these methods of education delivery will make university programs more accessible to people in many areas of the Maritimes which are not in close proximity to a university. At this point, a complete inventory of extension and distance education in the Maritimes is currently in preparation, together with a discussion document.

3. POST-SECONDARY EDUCATION AND ECONOMIC COMPETITIVENESS

Education is a key infrastructure component of the economy. Human capital is important for economic development, and education in developing human capital, is a considerable factor relating to economic performance. The educational attainment of the population is a significant indicator of an economy's potential for economic growth. A large proportion of economic growth is accounted for by physical investment and technological advancement, but the balance can be linked to human resource investment or education. Estimates of the contribution of education in accounting for economic growth rates have ranged from 0.8 per cent in Mexico to 25 percent in the United States.[2] It is also well known, that higher education is on average associated with personal economic benefit in the form of higher incomes and better jobs. Thus, education is a major investment comparable to the components of physical capital, which is of benefit for society, the economy, and the individual.
It should also be noted that the changing economic and technological environment requires people to enter the labour market with a minimal level of competence to enable them to be productive by applying knowledge and/or learning new skills. Adequate levels of literacy and numeracy in addition to knowledge of basic scientific principles are required to effectively function in society as well as learn technological applications. A number of studies have been conducted which link increased literacy rates to higher rates of economic growth [Hicks (1980) and Wheeler (1980)][3]. The requirement for the adaptability in the workplace, makes it increasingly difficult for less educated workers to be productive and secure or retain employment.

Education/training also plays an important in role in providing the knowledge and skill requirements in an economy which is rooted in a growing "information society". The changing structure of employment has affected the skills requirements and operations of industry. The proportion of people employed in the secondary sector or goods producing sector has declined over the past decades, while the service sector has increased its proportion of employment. Employment in the service sector accounts for over 70% of total employment in Canada as well as the Maritimes. Many occupations and tasks which were basically manual in nature, increasingly require more cognitive abilities and higher skills in reading, writing, and scientific and technical literacy. People need to be educated to develop abilities to conceptualize, integrate and apply rational management to processes and information. More and more, the skills and education of workers in the "information society" are crucial for the competitiveness of industry and the effective performance of the economy.

Competitiveness is also linked to an economy's scientific and technological capacity which contributes to diversification and development. New products and enhanced productivity stem from the development and application of technology. Moreover, successful competition in the trading environment is attributed to technological innovation and application. Higher education is a necessary component for a number of reasons. A supply of highly qualified scientific and technical professionals is provided through the post-secondary education system. Post-secondary institutions as well as graduates in the workplace are also an important source for the advancement of knowledge through research and development. In addition, higher education contributes to technological change and the effective use of new technology. Finally, disseminating the capacity for technological innovation to business managers and entrepreneurs is also a

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[2] The Organisation for Economic Co-operation and Development, OECD Employment Outlook July 1989, OECD, 1989, p. 50.

[3] The Organisation for Economic Co-operation and Development, OECD Employment Outlook July 1989, OECD, 1989, p. 50

function which higher education fulfils through its research function, education programs and supply of well educated graduates.

Innovation not only leads to technological development. Innovation also contributes to the creation and successful functioning of businesses as well as the organization of effective work processes. Efficiency and productivity in the workplace depends largely on the qualifications of those who perform the work as well as the people who manage and train personnel. In the case of business expansion and entrepreneurship, innovation also comes into play and is a means of expanding employment opportunities and thus promoting economic growth. Education fosters innovation because it imparts knowledge and develops human resources with a high level of technical, managerial and training skills to enhance competitiveness.

Education also has broad implications for society and the economy. It provides a foundation for individual development and self-fulfilment. Common values, tradition and culture are also embodied in the educational process. Society also requires education in order to be able to use technology as it chooses, and for purposes that do not bring undesired effects. Issues including environmental effects of product development, waste management and environmental protection, require a well educated and knowledgeable society. For example, advancement of "sustainable development" compels education to promote innovation, creativity and changes in the formation of knowledge in society.

Overall, a productive, well-educated, well-trained labour force is an important factor for success in a competitive market environment. The Maritime economy has been challenged by national and international competition, technological change and economic development. The competitive environment which the economy faces, causes businesses to either excel in order to succeed or to falter when they cannot compete. In both circumstances, education/training play a key role in responding. As indicated above, education and training support industry's need for a proficient and stable human resource base. Since, education/training provides the basis for this, it is an important key to successfully competing in the global market.

Education/training also facilitates adjustment to changes in the economy resulting from business failure or restructuring, and technological change. When skill requirements change, education/training is fundamental in redeploying workers who still have years of potential in the labour market. In effect, education and training is instrumental in helping workers remain employed and productive.

It is clear that post-secondary education in the Maritime provinces including existing cooperative efforts, constitutes a significant contribution to economic competitiveness. Therefore, additional cooperative activities contributing to more efficient and effective post-secondary education will only serve to improve the competitive position of the Maritime economy. The link of post-secondary education in fostering the regional economy assures this.

As a sector, education/training services also have potential for contributing to economic growth. International demand exists for education/training; however, there is limited information available about the markets which exist. Provinces such as Ontario and Alberta have been seeking international markets in order to offer access to their programs on a cost recovery basis. Development of customized services to meet specific requirements at foreign locations has been another target for international marketing of education and training services. Education/training relating to new technologies, practical skills and specialized skills for professionals is growing in demand in international markets. Competition among industrialized countries to meet these demands will increase as the long term potential of international markets unfold.

The international marketing of education/training services is beneficial for economic competitiveness because of the significant commercial opportunities involved. The delivery of programs for an international market can also serve to stabilize enrolment and enhance the range of programs available to domestic students, as well as promote research activity. High quality education/training is available in the Maritimes, and a coordinated approach to market it internationally would further contribute to the economic competitiveness of the region.

4. EXISTING AND POTENTIAL AREAS OF POST-SECONDARY COOPERATION

Introduction

Cooperation in post-secondary infrastructure is possible where it addressees common functions, interests and services in post-secondary institutions. Efforts to cooperate will occur if there is willingness as well as a common vision of resulting benefit and gain involved. The structure of post-secondary education and the institutions which deliver it have many similarities in the Maritime, and this presents a suitable foundation on which to build more cooperation. However, barriers to cooperation must also be recognized. Many post-secondary institutions operate with large autonomy, and they often feel a certain degree of competition from other institutions. Others have established traditions and processes which they are resistant to alter. In some instances where institutions are inclined to cooperate, there is often inadequate commitment, time and resources to achieve it. Steps toward fuller cooperation will require a clear understanding of the potential benefits as well as committed leadership. The following is a discussion of several areas of existing and potential cooperation in post-secondary education.

A. Research and Technology Transfer

A significant proportion of research and development (R&D) is performed in universities. The proportion of total R&D in Canada which is carried out in universities is about 25%; this is higher than in many other industrialized countries (Science Council of Canada). Universities play an important role in industrial R&D, and cooperative efforts among Maritime universities to strengthen R&D could be beneficial.

Research and technology is transferred from universities to industry through a number of means. Methods include consulting, contract research, joint ventures and technology development. However, industry frequently is not familiar with the existing knowledge and research available through universities. Better communication and collaboration with industry by universities would help to improve the level of R&D which is transferred to industry. However, universities face common problems in achieving this. Funds, administration, space and appropriate faculty expertise are some of the factors which can be difficult to acquire. Maritime cooperation to develop Technology Transfer Offices or Research Centres has the potential to address some of the problems individual universities face in trying to develop these industry linkages on their own.

Regional coordination through research centres is a method to encourage industry interaction and involvement in university research. Research can be disseminated more effectively to businesses and at the same time, involved universities can develop opportunities to attract grants and contracts. Possibilities for graduate students to gain experience and perhaps exposure to potential job opportunities also exist through research centres.

More and more universities in North America and elsewhere are establishing technology transfer offices to facilitate strong coordinated links with industry. For example, Dalhousie University set up an Office of Technology Transfer in 1988 specifically to commercialize intellectual property and to serve as a focal point to serve a growing industrial interest in university research and development. Many other universities in the region could also profit from the assistance that this type of office can provide, but their size and resources do not always permit them to set up their own offices. The concept of establishing a regional office has been considered and, as a first step, discussions are currently under way between Dalhousie University, Technical University of Nova Scotia and University of Prince Edward Island to determine if agreement could be reached for a joint office serving the three institutions. The intention is that if this initiative turns out to be successful, then other institutions could be invited to participate.

Another example of coordination in technology transfer is the Manufacturing Technology Centre (MTC), which has various locations in New Brunswick. The MTC was formed in 1983 as an non-profit association with the mandate to transfer technology to industry. Its goal is accomplished through research and development, application of advanced engineering techniques, software development and design, training programs, demonstrations, workshops and consulting services. When it was first established, there were unsuccessful attempts to broaden the network to cover the Atlantic area. However, officials of MTC believe that there would be great benefits in establishing an Atlantic network and given the proper government commitment, that an Atlantic system could be formed. In fact, the people involved in advanced manufacturing in the Atlantic region have taken the initiative to create an organization to work toward enhanced Atlantic cooperation. Organizational meetings have recently taken place to formalize a structure for the Atlantic Canada Alliance for Advanced Manufacturing and Engineering.

The Atlantic Canada Alliance for Advanced Manufacturing and Engineering has the main objective of providing a forum and organization to facilitate technology services to industry in Computer Aided Design (CAD), Computer Aided Manufacturing (CAM), Computer Aided Engineering (CAE) and Computer Integrated Manufacturing (CIM) and related technologies. Membership will be open to Atlantic Institutions actively engaged in engineering education, research and development, and transfer of technology to industry. The Alliance's rationale is to improve links between centres involved in advanced manufacturing and engineering in order to improve access to resources and reduce duplication in an environment of limited program funding. The work of the Alliance will focus on facilitating information transfer among members, networking and communications, as well as acting in an advisory capacity for governments and other agencies in the Atlantic region. The present ad hoc members of the Alliance are MTC of the University of New Brunswick, the Nova Scotia CAD/CAM Centre of the Technical University of Nova Scotia and The Centre for Computer Aided Engineering at Memorial University. It has been proposed that the membership be expanded to include l'Université de Moncton, Mount Alison University, the University College of Cape Breton and the University of Prince Edward Island.

The above examples of initiatives for coordination in technology transfer are not exhaustive. A range of other networks and ventures are also evolving. It is obvious that more support and promotion of research and technology transfer would be beneficial for the region.

B. Mathematics, Science and Engineering

The development of science in the gion has been a specific topic of interest. A summary of recent trends in enrolment at the region's universities is presented in Figures 1 and 2 (page 23). Several factors are significant. Total undergraduate enrolment of 8,050 in the Sciences and Engineering in 1990-91 is almost exactly the same as the level of 8,029 in 1982-83, despite an increase in total undergraduate enrolment from 33,377 to 42,924 over the same period. At the same time, the distribution between scientific fields has changed dramatically, with a decline of about 500 in each of Engineering and Applied Science, and Mathematics and Physical Science, and an increase of over 1,000 in the Agricultural and Biological Sciences. (Appendix 5 contains a series of figures illustrating enrolments by gender, program level and program type.) The change of distribution in the scientific field is partly explained by the increasing participation of women, who historically have preferred the agricultural and biological sciences. In terms of overall male participation in these fields there has been a decrease from 5,850 to 5,158 with a drop of 650 in engineering and applied sciences.

Figure 1
Enrolment changes
Undergraduate Total

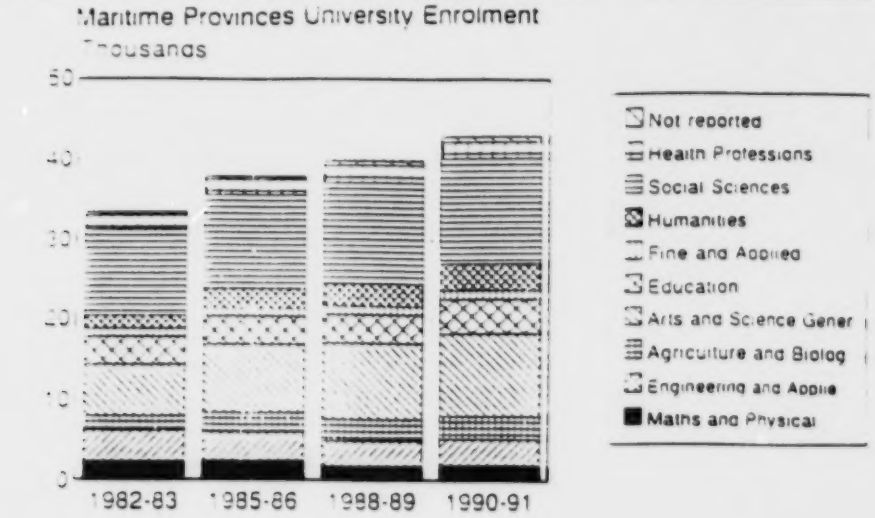
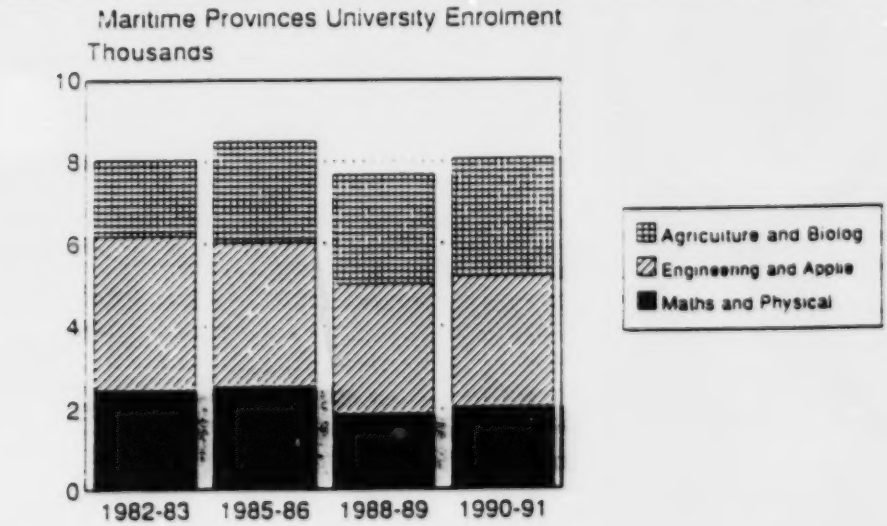


Figure 2
Enrolment changes
All undergraduate Science



Graduate enrolments in all the science areas have increased, between 1982-83 and 1990-91 despite the changes at the undergraduate level. The total number of masters' students has increased from 523 to 638, while the number in doctoral studies has increased from 206 to 373. While much of the increase is accounted for by increased enrolments of foreign students, the net increase in Canadians is 10 at the master's level and 47 at the doctoral level. In all three areas of study the proportion of women has increased at the graduate level as well as at the undergraduate level. It can be observed that the number of persons studying Mathematics and Physical Sciences, and Engineering and Applied Sciences has tended to follow more closely the number of persons in the 18 to 24 age group than the number of persons attending university. This suggests that the type of student who wished to study in these fields has always been encouraged and able to go to university, and that the growth in participation has not significantly affected the supply of potential scientists and engineers.

There have been a number of initiatives in recent years, such as the Canada Scholarship program, that are intended to increase science enrolments, particularly among women. The significant increases in women in Engineering and Applied Sciences, and Mathematics and Physical Sciences, between 1988-89 and 1990-91, suggest that these activities may be having an impact. There will probably be a continuation in the growth of enrolments in the sciences and engineering for the next few years.

Creating graduate engineers and scientists however, does not necessarily transfer into a direct increase of these professions practising in the work force. In a recent address to the Canadian Research Management Association, the Chairman of the Science Council of Canada pointed out that many qualified professional scientists do not follow their profession, or move into management[4]. Many of those graduating in these fields do not end up as direct practitioners of their subject. A recent study has shown[5] that only 14% of 1982 Chemistry graduates were working in chemistry in 1984, and only 21% in 1987. Of the 1986 graduating class, 26% were employed as chemists in 1988. Chemical engineering graduates show a similar pattern, with 19% of the 1982 class employed as chemical engineers in 1984, although 62% were employed in engineering. Another study[6] has shown that in 1986 only 43% of those whose field of study was engineering were working in engineering occupations. This study also showed that almost one quarter of engineering graduates do not immediately enter the labour force on graduation, and of those who do, only two thirds select engineering occupations.

Students in general are sensitive to the market place. The growth in enrolment in business related subjects reflects the view that they offer a good preparation for a business career. If the region is not producing large numbers of graduate scientists and technologists, this may be a reflection of the job market in the region, that does not create a large enough demand to encourage students to make careers in these fields.

The preceding information demonstrates that many factors influence the level of university enrolment in mathematics, science and engineering programs. Although universities in the region can take steps to attempt to improve enrolment, it is recognized that such measures will not be able to alter many of the circumstances outlined above. However, this issue will be given consideration as the university role and

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[4] Janet E. Halliwell, Problem or Paradox? Human Resources for R & D, Address to C.R.M.A. 29th Annual Meeting, Sept 1991.

[5] Graham Orpwood, The Chemical Professions in Canada: Employment and Education for the Future. Report of the Industrial Adjustment Committee on the Supply and Demand of Chemical Professionals in Canada, June 1991

[6] Dalcor Innoventures Limited Engineering the Future: Outlook on the Profession, Prepared for the Canadian Engineering Manpower Board and the Employment and Immigration Commission

capacity statements are completed in the Maritime Provinces, and decisions are taken with respect to program rationalization and specialization.

C. Professional Development

Professional development is beneficial in post-secondary education because it facilitates administrators, instructors and support staff in doing their jobs more effectively. It also allows practitioners to exchange ideas and seek relevant viewpoints from industry. Cooperation in this field can be useful because with their own limited resources, college and university campuses may not be able to afford and/or be compelled to place optimal emphasis on professional development. Cooperative efforts could help to achieve more systematic and efficient arrangements for professional development.

Efforts to coordinate professional development within a region can be cost effective for educational institutions. For example, hiring consultants and/or speakers can be achieved at a lower institutional cost when the effort is shared by a group of institutions. Of course, costs of travel can present problems for participants if institutional budgets do not include travel allowances.

Various forms of professional development presently occur on a regional basis. In the case of the universities, opportunities for professional development are provided through the activities of the National and Regional Associations listed earlier in this report. Annual meetings of organizations such the Canadian Association of University Business Officers and the Atlantic Association of College and University student Services are focused on the professional development of their members. Two or three day programs of invited lectures and discussion groups are carefully planned to ensure that members have an opportunity to learn of the latest developments in their particular areas of activity. These meetings are well attended and have proven to a very effective way of disseminating ideas and information.

Those going into senior administrative positions may attend a two-week Senior University Administrators Course originated by the University of Western Ontario, and now run by the University of Manitoba. A similar program exists for those in middle-management positions in the universities.

At the college level, the Atlantic Colleges Development Institute has recently been established to provide a forum for professional development and networking among regional college administrators. Through conferences, workshops and networks, administrators in the region have the opportunity to develop appropriate management, leadership and planning skills.

However, with respect to professional development for instructors in college level education, there is often a significant challenge in the development and/or maintenance of instructional and subject matter expertise. Instructors who are hired tend to have extensive occupational experience in their field, but do not necessarily have background in instructional skills and theory. Many forms of professional development for college instructors exist in the Maritime provinces and include initiatives such as: instructor development programs for the development of teaching skills; industrial attachments which help to maintain subject matter and technical expertise; sabbatical leaves; educational leaves; second language training; and various short courses, workshops, and conferences. Some of these types of services would need to maintained separately in each province to appropriately meet their needs. However, there is potential for some to be centred in one particular province, thus decreasing administrative costs. An example might be institutes or conferences for instructors of specific subject areas. At the same time, it would be necessary for jurisdictions to eliminate restrictions on out of province travel within the Atlantic provinces in order to promote access to developmental opportunities in all member provinces.

Cooperation between universities and colleges in the area of teaching development may also have potential since a function of universities is to provide education and training for teachers. The expertise of faculty in university education departments could be utilized to a larger extent by colleges in the professional development of college instructors.

Cooperative efforts in human resource planning among educational institutions, particularly colleges could help them to better prepare for future staff requirements. Instructional staff with required qualifications and certification are essential for the delivery of quality education and training. Measures to ensure portability of credentials would benefit college employees and provide an increased pool of qualified instructors in the Maritime region. An agreement concerning the minimum acceptable qualifications for instructors and comparable salary scales would promote comparable quality of instructional staff and decrease competition between provinces for difficult to recruit specialties.

Cooperative efforts in other areas than those discussed above could also be examined in order to foster development in fields which colleges and universities have limited practice.

D. Curriculum Development

Industries within a regional labour market generally have similar skill requirements for occupations. Cooperative efforts in curriculum development can better serve industry with a regional workforce possessing the quality and range of skills needed. More comparable skill levels which are recognized by industries will also help to enhance regional job opportunities and mobility for graduates. However, for educational institutions, curriculum development and the development of testing instruments is very expensive. The validation process is also expensive and very time consuming.

There have been several initiatives at the Atlantic level in the area of college curriculum development and information sharing. For example, during the early 1970s, the Atlantic Regional Coordinating Committee was established with the purpose of: 1) sharing curriculum information and materials; undertaking joint curriculum development in areas deemed appropriate, and 3) exploring appropriate areas for joint cooperative projects. The Committee was first organized with the operation of two sub-committees, one for the skill area, the other for Adult Basic Education. In 1985 the two groups were integrated, however shortly after, the committee stopped its activities. This was mainly due to a change of players and a general lack of financial commitment, especially with respect to funds required for travel.

The Regional Coordinating Committee was instrumental in the process to develop a formal agreement commenced in 1980 between New Brunswick and Nova Scotia to jointly develop curriculum material for the Carpentry trade. The project called for both provinces to pool their resources to develop training packages and undertake a common validation exercise. However, the project was cancelled after a period of a little over one year. The system was determined to be too cumbersome. Furthermore, it was started without a firm financial commitment on the part of both parties. Travel was much more expensive than originally thought and getting permission to travel outside respective provinces became a problem as special approval and budgets were required. This was the last curriculum project involving formal consultations and exchanges between the Atlantic provinces.

People who have been involved in curriculum development projects seem to agree that proper mechanisms can be implemented so that the process can be made to work with significant benefits to all those concerned. A well organized process with appropriate financial resources and the commitment of members could promote coordinated regional curriculum development. This would result in a more consistent quality of skilled workers available to regional industries, and improved cost efficiency in curriculum development activities.

E. Program Development

Increased cooperation in the development of post-secondary education programs can be very productive. Thorough program development in a cooperative arena takes into account: (i) planning for existing programs and the potential for shared resources; (ii) requirements for student accessibility and; (iii) human resource planning. These issues are discussed below.

(i) Program Planning

It is beneficial to undertake program planning in cooperation with other jurisdictions in order to avoid unnecessary duplication, enhance accessibility, and achieve economies in offering quality education.

Program development may involve the introduction of a program that already exists in a region. Instances of program duplication require careful consideration, because it may not be effective and efficient to offer an additional program in a region. For example, the cost of developing another program may be higher than making arrangements to allow student access to an existing program in a region. Regional labour market demand may also not warrant the level of increased training resulting from the addition of a program.

When a new program is planned in a region, joint development and consultation can also be effective. Programs that are introduced in consultation with other jurisdictions can be developed to consider plans, needs and resources of those concerned. As appropriate, new program development could include arrangements for student access and funding.

There are a number of examples of college level programs which have been planned to provide access to students outside provincial boundaries. These include the dental assistant program offered in Prince Edward Island which receives New Brunswick students, the Funeral Education program in Nova Scotia which receives New Brunswick students, and the Avionics program offered in Moncton which is not offered in other provinces.

Cooperation in program planning in university education in the Maritime provinces currently takes place through the coordination of the Maritime Provinces Higher Education Commission. New programs are justified in terms of existing programs, requirements, and resources. The Maritime Provinces Higher Education Commission has also developed a regional funding structure where each province provides grants to the two other provinces in respect of any of its university students enroled in programs that are not offered in the students' province of residence.

A potential area for further cooperation in university education within the region exists in coordination of university graduate programs through joint arrangements. In order to offer graduate programs, faculty expertise is required, particularly to supervise and review theses work. While one campus may be able to offer graduate level courses, it may not be able to hire a full time faculty member in a specialized field. Specific joint degree programs and/or faculty appointments could be arranged to offer a wider range of quality education for graduate students in a cost effective way. Students would be able to pursue desired graduate programs without leaving the region. Research efforts could also be strengthened without financial burden to individual university campuses.

(ii) Student Access to Programs

Delivering quality education with scarce resources is a challenge common among provinces. Cases of very high program costs and/or limited demand make it impossible for jurisdictions to meet every resident's demand for education and training programs. As noted above, the cost of developing a program may be higher than making arrangements to allow student access to an existing program in a region.

The Maritime provinces have a long history of cooperative initiative in the area of accessibility to programs not offered in their own particular province. In the University area, the Maritime Provinces Higher Education Commission has played a coordinating role since 1974. The Commission has also served as the facilitator and funding agent for a number of regional non-university programs such as agriculture and forestry. As previously mentioned, there have also been understandings among provinces by which some programs would not be duplicated but student access would be permitted.

There is great potential for regional cooperation in student access to programs. The experience so far has clearly indicated that there are economic benefits to a regional approach in some areas of programming. If the Maritimes are to continue to be competitive, its labour force will have to be properly trained in non-traditional areas, namely new and emerging occupations.

Cooperation in the high-tech area would also facilitate the establishment of centres of excellence. These centres of excellence would have the advantage of not only providing the training and re-training, but they could also provide grater opportunities for research and technology transfer. The net result is a higher degree of private sector involvement and commitment and the greater possibility for the provision of relevant training and re-training.

What appears to be needed is a mechanism whereby the coordination of specialty programs and/or centres of excellence, can be made possible. Provinces will probably be more interested in such arrangements if a sense of fairness can be instilled in the system. A regional training agreement could very well serve this purpose. The agreement would develop Maritime planning in areas of key technical and technological training areas. The planning process would have the potential to offer a wider array of programs in areas almost impossible to offer otherwise. In this way both learners and regional industry would be better served.

(iii) Human Resource Planning

Human resource planning from an economic perspective involves planning in education/training in attempt to acquire more balance between supply and demand in the labour market. In an organizational context, human resource planning is undertaken to prepare for future staff requirements in terms of the number of workers required with given skill levels. Human resource planning by businesses is subsequently instrumental for the recruitment and training or upgrading of employees.

Human resource planning with respect to the supply of education and training is carried out in general manner by the MPHEC. University proposals for new programs and program changes are submitted to the MPHEC. The proposals are required to justify programs with respect to existing programs which are the same or similar. This program planning which takes into consideration the existing supply of education is a form of human resource planning.

In order for human resource planning, with respect to education and training levels to be undertaken in a very comprehensive manner, adequate labour market information gathering and analysis must be in place. Labour market analysis is a complex task which incorporates a wide variety of information. Labour

market analysis is undertaken in varying degrees and methods in all provinces. In every case it is a complex task which may involve many factors such as: compilation of actual data on the population, employment, attrition, unemployment, enrolment in educational institutions, new graduates, labour mobility, and immigration; modelling techniques; theoretical assumptions; survey results; and collection of a wide variety of data and information from industry. In this context, cooperative efforts present a great challenge because the development of a system of consistent labour market information among provinces would require substantial costs and efforts to accomplish.

Cooperation in human resource planning which does occur in the Atlantic region has not been systematic. Annual Atlantic regional workshops are held by Employment and Immigration Canada to discuss Canadian Occupational Projection System (COPS) and Informetrica economic and labour market forecasts. These workshops present opportunities for provincial officials involved with labour market analysis to gain an understanding of activities undertaken in other jurisdictions. Occasionally, through participation of individual provincial representatives on federal/provincial steering committees for specific research projects, communication and sharing of views between regional governments will also occur on an informal basis.

More focused or strategic human resource planning has rarely been the subject of regional cooperation with several exceptions. Occasional projects have caused cooperative discussion of regional human resource training requirements but meetings have not resulted in preparation of regional strategic plans. The regional purchase of training beyond a province's boundaries may result in a few formal undertakings like that concerning the Nova Scotia Agricultural College in Truro, but more frequently occurs in the wake of bilateral discussions between a province and another province's individual training institution. There is no overall strategic plan for such regional training requirements.

At the private firm level, human resource planning assistance is cooperatively provided by the federal government together with individual provincial governments. However, assistance provided to businesses for human resource planning has not been the subject of regional interprovincial discussion or cooperation. In instances of successful provision of training for human resource adjustment in businesses, indeed, the Maritime Provinces have often been direct competitors with each other.

Provincial human resource planning systems and labour markets are sufficiently different to make overall regional labour market analysis an arduous exercise. However, more coordination in program planning might be established, to ensure that regional consultation is involved to avoid unnecessary duplication. Another area which could be examined is the development of sectoral studies involving similar industries in the region. A further area would be the development of a regional human resource planning strategy with respect to labour requirements for major projects in the region which may affect all three provinces (ie. Fixed Link proposal). In addition, cooperative approaches could be considered for annual plans for the purchase of training outside each province as well as human resource planning assistance to businesses.

F. Purchasing Goods and Services

Cost effectiveness can be achieved through the cooperative purchase of goods and services commonly used by educational institutions. Movement towards this principle was achieved in 1989 when the ***Maritime Agreement on the Reduction of Interprovincial Trade Barriers: Government Procurement*** was signed. It was the first step in efforts to bring down provincial trade barriers and obtain the best value for funds used to purchase goods and services.

The Agreement applies to government departments in the Maritimes concerned with education. Community colleges are covered because their purchases occur through purchasing agencies. However, universities are not yet included. Discussions with universities will be undertaken by the Assessment

Review Committee of the Maritime Procurement Agreement to develop processes whereby they will operate under the principle of the agreement.

Cooperation in the purchase of certain items currently takes place among some universities in the Maritimes. One example of the benefits of inter-institutional cooperation is that of the New Brunswick-Prince Edward Island Educational Computer network. This network operates under an agreement signed between the four universities in New Brunswick, the University of Prince Edward Island, and the Maritime Provinces Higher Education Commission. Holland College is exploring the possibility of joining the network starting in 1991-92. The principal purpose of the network when it was first established some dozen years ago was to promote the development of the mainframe computing facilities at the University of New Brunswick as a central facility to be available to all institutions. A better facility could be established co-operatively than by trying to establish separate facilities on each campus. With the increase in the power and decrease in cost of computer hardware, most institutions are more or less self-sufficient with regard to local computing facilities. The current emphasis of the network is now more on the provision of network communication services connecting the institutions to world-wide computer communications networks.

The New Brunswick-Prince Edward Island Educational Computer Network also effects cost savings through joint purchasing, such as the recent signing of an agreement with Borland International for a joint site license for the company's software products. This agreement will be of particular benefit to the smaller institutions which would otherwise have had to spend a few thousand dollars more per year for a similar agreement for their own institutions if negotiated independently.

Another example is Interuniversity Services Incorporated, a corporation established and owned jointly by the universities in the Halifax-Dartmouth metropolitan area for the purpose of effecting cost savings through the joint purchasing of goods and services. This company has been very effective in reducing costs to its member institutions both in terms of the prices paid for goods and services, and in terms of the administrative costs of acquiring them. Associated membership in the corporation has been offered to universities in other areas of Nova Scotia and currently eight universities are benefitting through some 70 purchase agreements. The annual savings to the institutions are estimated at $1.5 million per year.

A library network in Nova Scotia called NOVANET is also operated by Interuniversity Services Incorporated. This network provides a common library cataloguing and circulation service for several institutions in the Halifax-Dartmouth area, as well as the University College of Cape Breton. It is discussed in more detail in a latter section, H) Library Services and Information Technologies.

On a broader front, the Atlantic Association of University Business Officers has a Committee of University Purchasing Managers which is also active in the area of joint purchasing on a regional basis. Contracts have been arranged by this group covering such commodities as bed linen and paper products.

G. Business/Education Partnerships and Entrepreneurial Development

Means to capitalize on business and research resources in a region can be developed through cooperative measures to improve information and communication between educational institutions and industry. Mutual benefit could result for industry and educational institutions with a system of coordinated communication. By going through a central system or agency, industry would be able to communicate their questions, needs and available resources to regional educational institutions more efficiently. Less time

would need to be spent by businesses to communicate with various institutions because duplicated efforts would not have to take place. Better knowledge of available programs and skills could also result for industry. With a known focal point for communication, more businesses may also take the initiative to communicate their needs and interact with educational institutions.

The coordination of communication with industry could also be beneficial for institutions. Opportunities for student co-op positions in a region could be more readily identified as well as potential positions for instructors on an exchange or summer term basis. Information about the potential of gaining access to industrial equipment for research and curriculum development might also be facilitated. With improved communications and a better understanding of the role of post-secondary education, businesses may also be more willing to support institutions through various means such as scholarships, and the loan or donation of equipment.

Entrepreneurial development can also be fostered and promoted through post-secondary education institutions. Entrepreneurship contributes to regional economic growth and is an important activity requiring attention by the educational system. One existing means of support is in the Atlantic region is the Atlantic Entrepreneurial Institute. It is a non-profit agency with offices located at Acadia University, the University of Prince Edward Island, l'Universite de Moncton, and Memorial University. It supports entrepreneurship by providing counselling services to businesses, developing informational data bases on businesses in the Atlantic region, and compiling case studies on the experiences of regional businesses for use in business education programs.

An entrepreneurship eduction program is currently in the process of being developed at Holland College. The Distance Delivery Project for Entrepreneurship Development will involve three learning centres in PEI. Training packages which are industry and skill specific will delivered at the centres through telephone line communications with instructors. Programs entrants will be subject to a diagnostic process involving the identification of individual entry and exit levels according to required skills. An Industrial Advisory Committee with representatives from businesses in the Maritimes is currently involved with curriculum planning to define skills which will be conveyed through the program.

Many university and college programs in the Maritime provinces provide management skills that are useful for people who are interested in starting up their own businesses. However, the role of higher education in educating persons as entrepreneurs will require closer examination. The Entrepreneurship Development program at Holland College will the first of its kind in the Maritimes. Its establishment may serve as the foundation for a entrepreneurial distance education network in the region.

H. Library Services and Information Technologies

Libraries are an important source for accessing knowledge and their importance is increasing as the "information society" unfolds.

Libraries operate under stringent budget allocations and face rising costs and increasing numbers of available books, periodicals and electronic information systems. Cooperative measures can assist libraries in maintaining quality learning and research resources within financial constraints. Cooperation in resource-sharing, collection development, and systems acquisition or development can enhance the function of libraries.

Resource-sharing through the mechanism of interlibrary loan is a standard function of libraries. Larger libraries have the greatest demands placed upon them, but in any size library problems arise as transactions increase. A system has recently been developed to compensate net lenders which have at least 100 interlibrary loan transactions. Further coordinated approaches to cost-sharing as well as improved methods of document delivery may enhance regional interlibrary loan service and help make it more cost effective.

Resource-sharing also occurs through collection rationalization. For example, several larger libraries in the Halifax-Dartmouth area, including some libraries outside the post-secondary forum, have cooperated in the area of serials acquisitions for a number of years. Cooperation also occurs in the area in regard to the development of areas of special strength in collections, and attempts to avoid duplication of costly resources. This history of cooperation can be further built upon and expanded as program changes occur in universities. Issues such as collection development with respect to new program areas, and the concurrent transfer of library materials with programs need to be addressed.

Library systems range from those designed for small libraries, to those capable of operating in regional and national networks. A library system provides a range of technical and administrative functions, as well as an on-line public access catalogue. These systems are costly to purchase and maintain. They have limited lifespans, and require major upgrades or replacement by larger and more sophisticated systems as the network and its individual collections grow. Such systems are needed to maintain productivity and services without additional funding.

A notable achievement in university library cooperation in the Atlantic region is the NOVANET consortium. NOVANET presently includes Dalhousie University, the Technical University of Nova Scotia, Saint Mary's University, Mount Saint Vincent University, the Nova Scotia College of Art and Design, the University College of Cape Breton, and the University of King's College. NOVANET has expanded from its original membership, and hopes to add other research libraries. This shared library system provides a common database of library holdings, and greatly facilitates resource-sharing between its members. It also allows for sharing of staff training between users of the system. NOVANET exemplifies the kind of library cooperation initiative which should be encouraged and supported.

I. Distance Education

Educational institutions operate under resource constraints, and it is not always possible to make programs available to people in every location, especially those areas which are physically remote from an institution. Many people who pursue education and training programs must also combine work and personal responsibilities. Therefore they require flexible program scheduling to meet their needs. Transportation and travel time are also at issue when a desired program is not available in their community. Life-long learning opportunities are limited for some people, depending on their personal circumstance and location of residence.

However, access to programs can be achieved over a distance by various means. Technological progress has enabled instruction through television broadcasting, audio and video tapes, and teleconferencing. In addition, courses can be delivered in a more traditional method of distance education, through correspondence, with or without supplementation through technological means.

The technological delivery of distance education is very costly because it requires a large investment in appropriate equipment and technical expertise. Cooperative efforts in distance education would not only

serve to make a larger number of courses available to more people within the region, but would make the process more cost effective for all those involved.

Currently, the Atlantic Association of Universities publishes a calendar of university distance education courses offered in the Atlantic provinces. A large number of universities offer distance education courses and the calendar provides a listing of all courses under one cover to facilitate awareness of the range of courses that can be accessed. This is beneficial for both the people who are interested in knowing about the availability of courses, and the universities which require a marketing mechanism.

Distance education is developed in the Maritime region through a number of approaches. Recently in New Brunswick, a Distance Education and Telehealth Committee was formed to focus on education, training and public information as well as other examples of contributions that could be made to a provincial distance education and telehealth project. A five-year project proposal was developed with the mission to provide increased and equitable access for as many New Brunswick citizens as possible, to a range of training, education, health and information opportunities and services, through community based learning centres. Functioning in both French and English, the project is designed to foster and support intersectoral collaboration and partnerships between various public and private sector agencies in New Brunswick, and may lead to the establishment of a permanent agency.

In Nova Scotia a proposal has recently been approved to begin the development of a telecommunications network capability throughout the Province facilitated by the Nova Scotia Communications Agency. The telecommunications network called, Network Nova Scotia will allow: secondary and post-secondary education skill training in a number of locations of the province not now well served; cost effective sharing of telecommunications facilities for distance education; facilitation of more rapid utilization of information technology for education and training; and increased coordination and cooperation between and among institutions at the various levels of the education system.

There will be two phases in the development of Network Nova Scotia. Phase I will involve audio links of learning centres at fourteen Community College campuses. It will also allow the development of links with the distance education network of College de l'Acadie, the French section of the Nova Scotia Community College system. College de l'Acadie, operating as a college "without walls" will serve Francophones throughout the Province through a variety of distance education methods. Its system which is in the final stages of completion will include telephone links, audio-graphics[7] and interactive video. College de l'Acadie as well as universities in the province will be able to communicate with the 14 Community College campus learning centres, as will other potential users who have facilities to connect with Network Nova Scotia.

Phase II of Network Nova Scotia has not received funding approval at this time. It will involve the installation of audiographics equipment in addition to the audio links established in Phase I.

Distance education is a very important means of enhancing accessibility of university and college programs to people in the Maritime region. Coordination in the development of compatible technology and common systems would allow the evolution of a more integrated approach in program delivery and thus improve

[7] Audiographics is a personal computer based application which allows information such as charts, tables, documents and computer programs to be accessed and viewed collectively at various locations.

accessibility. Distance education is at various stages of development in different institutions and provinces in the region; it will be beneficial to support links of existing systems to ensure the best possible access to programs for people in the Maritime region.

J. Co-op Education

Co-operative or 'co-op' education is a process of education whereby students' studies are formally integrated with paid work experience with co-operative employers. When co-operative education was first introduced in universities in the Maritimes it mainly concerned engineering programs. Co-op education has been a growing field and now includes a wide range of college and university programs such as business, tourism, statistics and computer science.

The structure of co-op programs usually involves alternate periods of experience in appropriate work fields with classroom study. This type of education is beneficial to students because they are able to apply theory and techniques which they have studied, to the workplace. It also provides exposure to a variety of situations and challenges in a work setting, so that students are better prepared for the work world when they graduate. Employers who hire co-op students are able to gain a better understanding of the post-secondary education programs and the skills and knowledge which graduates offer. Co-op education also facilitates communication between industry and educational institutions, and this can assist in the development of program content which is more responsive to employers' skill requirements.

Activities which would improve employer awareness of available co-op programs and develop recognized approaches or standards for co-op programs, could serve to enhance co-op education delivery. For example, coordination of regional information concerning the locations and fields of co-op education could be helpful to employers. It would facilitate more efficient communication because the number of inquiries to institutions made by employers could be reduced. If focal points for communication become established, more employers may also come to recognize the availability and potential benefit of co-op students.

While program structure is generally understood when one refers to a "co-op program", actual structures of co-op programs can vary. It is beneficial to have standards in place to uphold quality in cooperative programming and to ensure employers have a clear understanding of what is involved. At the national level, the Canadian Association for Co-operative Education has developed accreditation standards for co-op programs. Its criteria or some variation could form the basis for agreement among institutions in the Maritimes, for the minimum standards to be met in order for a program to be designated as co-operative.

K. Literacy

An adequate level of literacy in the population is essential for human resource development, economic growth and adaptation to new technology. Many adults lack the level of literacy which will allow them to take advantage of further educational opportunities, compete in the labour market or lead satisfying and independent lives. As previously outlined, a variety of literacy training and related services are provided in the Maritime provinces. There are several examples of existing interprovincial collaboration in the area of literacy:

- Two regional meetings per year of senior officials (from the four Atlantic provinces) responsible for literacy to share information about initiatives and to identify areas for cooperation.

- Nova Scotia's tutor training and certification program has been provided in Prince Edward Island in 1990. In 1991, the National Literacy Secretariat funded a Training the Trainer program so that trainers from Newfoundland and Prince Edward Island could receive training in Nova Scotia. In addition, training for New Brunswick instructors was provided in September, 1991 by Nova Scotia staff. The National Literacy Secretariat has funded this training also.

- The New Brunswick Department of Advanced Education and Training is currently undertaking the translation of the Nova Scotia Tutor Training Program into French.

- Holland College presented a tutor training workshop using Nova Scotia materials and staff of Nova Scotia Advanced Education and Job Training in August, 1990.

- Eight Prince Edward Island tutors and teachers took "Train the Trainer" course in tutor training in Truro, Nova Scotia during August 1991.

- The new adult curriculum developed by New Brunswick Community College is being used by Holland College in daytime upgrading programs and plans are underway to implement the program throughout the nighttime academic programs as well.

- Assistance has been provided to the Francophone resource centre project within the provincial library system by Nova Scotia Advanced Education and Job Training in the form of advice on resource materials.

- Assistance was provided to Holland College and the Prince Edward Island Department of Industry by Nova Scotia Advanced Education and Job Training when selecting a computer-based learning centre system.

- Ongoing contact is maintained with the other Atlantic Provinces in terms of projects, events, contact persons, and procedures used in dealing with applications for funding and procedures used with the National Literacy Secretariat.

Although there is significant interaction and sharing of information in the field of literacy within the region, further cooperative activities are important to enhance the coordination of the delivery and accessibility of literacy training and services. A number of potential areas for further cooperation exist. Literacy services are required in both French and English in the Maritimes. Nova Scotia and Prince Edward Island could seek leadership from New Brunswick in the area of Francophone literacy and upgrading both through training and sharing of resources. Also, the information sharing currently done on a regional basis could be expanded to include administrators and instructors from the community colleges in the three Maritime provinces. In addition, other initiatives could be undertaken to develop a more integrated regional approach for the extension of literacy such as: 1) establishing common standards for academic upgrading programs; 2) adoption of common certification of literacy tutors; 3) organization of regional meetings of literacy students, tutors and teachers; 4) planning conferences involving all three provinces; and 5) exchanging more resources among the three provinces.

5. CONCLUSIONS AND RECOMMENDATIONS

A. Maritime Provinces University Education

Over the past two years, the MPHEC, in conjunction with the Nova Scotia Council on Higher Education, has been undertaking a total review of the roles and planned capacities of the region's universities. While the Nova Scotia section of the work is complete[8], that on the rest of the region will not be ready for another six months. The results of the Nova Scotia analysis lead to a number of recommendations for the more efficient operation of the universities in the Province, as well as ways of increasing the co-operation between institutions, which are already being acted upon. It may safely be assumed that the final report for the whole region will provide further information on opportunities for regional co-operation, once the review of New Brunswick and Prince Edward Island is completed. This section of this paper is therefore somewhat premature, and deals with only general issues, and not with program specifics. A year from now, more specific recommendations should be possible based on the detailed reports, and relating to individual subjects.

University education is at a cross roads in Canada in the 1990s. Student enrolments are continuing to increase, as the growth in participation has offset the decline in numbers in the traditional student age group. At the same time the state of the provincial economies, and the decline in EPF payments and other transfer payments will continue to put an increasing strain on the ability of the provinces to fund universities. In this environment, the options available to both governments and universities are limited. Significant growth in funding is unlikely, so that if accessibility is not to suffer, either the students will have to pay a significantly higher proportion of the cost of their education, or the quality and range of programs will have to be reduced, or universities will have to find more cost-effective means of program delivery. At the same time, the need to provide access for students to a university education will continue to increase. The need for greater efficiency in the delivery of university programs will continue, and become increasingly important.

The policy established by the Council of Maritime Premiers for the Maritime Provinces Higher Education Commission, is that any qualified Maritime student should have access to a university program, but not necessarily the program of his choice, or at the institution of his choice. There is no reason in any reasonable forecast of the future to suggest that it would sensible to change this objective, as the economic and human benefits of a post secondary education are still abundantly clear. As a result, the pressure from the community will be to provide more resources to provide more service from more institutions. The challenge will be to provide the needed service, with the resources that are available.

Universities are autonomous institutions. They are responsible for their own operation, while at the same time, highly dependent on government funding. They have a responsibility which goes with their autonomy, which is to reflect the realities and needs of the society in which they operate. The diversity of institutions in the region offer a wide range of choices to students wishing to go to university. The same diversity means that there are different specialisations and areas of excellence at different locations. This range and variety can contribute significantly to the economy of the region, provided that it does not become diluted

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[8] Maritime Provinces Higher Education Commission in conjunction with Nova Scotia Council on Higher Education, Role and Planned Capacity, Report 1 Nova Scotia Universities, May 1991

by each university trying to become all things to all people. Specialisation should be encouraged, while at the same time movement of students around the region should be as simple as possible.

Among the trends that have developed in recent years, is one of students preferring to study closer to home. This is believed to be partly for economic reasons, in that students from families with limited income find it easier to attend an institution to which they can commute, rather than live away from home. The disadvantage of this in regional terms is that there is more pressure to broaden the program base at some of the geographically isolated smaller institutions, to meet the local demand. The resources will not be available to permit this broadening, if it is to take place in the traditional way, by simply adding staff at the institution. The technology exists to permit broadening the base at such institutions through remote delivery of classes from other institutions for example, but there are at present institutional and human barriers to prevent this taking place to any appreciable extent. The greatest opportunity for obtaining increased efficiency through regional co-operation is in this area, but it will require significant changes in the system to enable it to take place, particularly in the context of how it should be funded, and who should be paid for it. In preparing this report an inventory is being prepared to determine the actual programming available through university extension and distance programming. This will supplement the information included in the Association of Atlantic Universities Calendar of Distance Education Courses[9]. The volume of data that has been collected has precluded an analysis within the time constraints of this document, but the total number of offerings is estimated to be in the range of three to four thousand. Clearly most of the necessary infrastructure is in place; the challenge will be the effective dissemination of such courses, and the equitable distribution of the costs and benefits.

Another solution to this problem would be to develop a much greater transferability of credit, so that students can in most cases complete the early years of their program near home, and only need to go away for one or two years. This will still require, however, that the student be aware of, and have access to, the appropriate courses to meet the requirements of his long term study plan. Greater regional co-operation between institutions will help to lead us to this goal.

It is important to understand that the Maritime universities are in relative terms small and teaching oriented. Only Dalhousie, the University of New Brunswick and l'Université de Moncton could be described as medium sized by national standards. Recent criticism directed at the universities nationally for the lack of focus on teaching is therefore less valid in this region. The region needs now, and will continue to need research activity, not only to enrich the scholarship of those teaching in the region, but to provide opportunities for graduate programs. There are also many local problems that will benefit from the studies of academic researchers. Because of the limited size of the institutions there will have to be more co-operation between researchers at different universities to achieve regional research goals. This also relates to the issue of course availability. A greater degree of specialisation by faculty can be achieved at an institution when a course which it offers is made available at other locations. Faculty specialisation also permits a better environment for the development of scholarship and research.

Technology will have an impact in other ways on future co-operation. University library services under stress from the increasing cost of periodicals and publications, at the same time that their volume is increasing, will be forced to share their acquisitions even more widely, and develop ready means of access to other libraries' materials. Organisations like NOVANET and the existing computer communication

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[9] Association of Atlantic Universities, Calendar of University Distance Education Courses in the Atlantic Provinces 1991-92

networks, originally established to take advantage of expensive centralised computing power, will become much more a channel for this kind of information sharing. At the same time the high cost of sophisticated software packages will require more co-operation in acquiring regional licensing, or in network access to a sole site user, while the proliferation of individual personal and micro computers will require cooperative bargaining power to obtain the best value from vendors.

While there are already examples of co-operation between universities in the same Province in fields such as Interuniversity Services Incorporated for purchasing in Halifax, there are further benefits that could be obtained by extending these on a regional basis.

At present students who are unsure of acceptance at the university of their first choice may make separate applications to a number of institutions. This includes over five thousand students who are studying outside their home province. This may be costly and troublesome to the student, as well as making forward planning less simple for the universities. In other jurisdictions such as Ontario, central application systems exist, which simplify application for the student, and provide a more accurate data base for accessing information on demand for university places. Both students and universities would be better served by a central application system. At the present time such a centre is under consideration by the Association of Atlantic Universities.

Recommendations

A system of co-operation has existed in the Maritimes since the establishment of the Maritime Provinces Higher Education Commission in 1974. This mechanism for co-operation should continue to extend its efforts to provide the best possible return to the region's economy in terms of an educated regional workforce, using limited financial resources to the best possible effect. The following recommendations are based on this assumption.

1. Each university in the region should be encouraged to specialise in its own particular area of expertise, and not attempt to offer all programs. Students wishing to take programs in the region should continue to be able to attend any of the specialised institutions for which they are qualified for admission regardless of which province it is offered in.

2. The universities in the region should work towards the complete transferability of credit between institutions, where the course that was taken is relevant to the program that a student is taking.

3. So that increased enrolments can be managed without dilution of program availability or quality, the universities in the region should co-operate in the delivery of their own specialised courses on different campuses, by distance education or other means.

4. A more equitable reward system should be established for both the originating and receiving institution, to encourage the implementation of recommendation 3.

5. A complete inventory of existing extension and distance education programs should be prepared, and assessment made to ensure that such programming can be made available as efficiently and extensively as possible.

6. Co-operative research and scholarship relating to the specific problems of the region, as well as pure academic research, should be encouraged.

7. Co-operative arrangements for purchasing between universities should be extended to all universities in the region, where practical and feasible.

8. The operation of computer networks and electronic communications between institutions in the region should be permitted to expand.

9. Detailed recommendations with respect to program modifications should be considered when the role and planned capacity statements for all three Provinces are available in 1992.

10. It is recommended that the Council of Maritime Premiers reconsider the MPHEC Report on Student Aid for the 1990s (November 1988) and also consider the Nova Scotia Student Aid Advisory Committee's Fourth Report (November 1990).

B. Maritime Provinces Community College Level Education

Recently the provinces of New Brunswick and Nova Scotia have been working towards developing a memorandum of understanding to improve the quality of Community College educational services and avoid unnecessary duplication of programs and services in the region. This ***Memorandum of Understanding Concerning a Program of Cooperation and Exchange in the Field of Higher Education*** will among other things, improve student access to Community College regions offered in the two provinces. It will also serve to formalize a number of existing informal arrangements which have been convened to share program resources. The Memorandum of Understanding will potentially provide more latitude in the types of services and activities in which provinces can formally cooperate. Conceivably there would be little or no net cost to provinces because a system of balanced exchange could be developed.

The future expansion of the Memorandum of Understanding is amenable because it could accomplish many cooperative benefits without the instalment of large adminstration structures or costly new organizations. However, to achieve effective results it will require commitment and action among the governments involved. In a number areas such as curriculum development, professional development and distance education, provinces are at different levels of progress and cooperation will likely evolve as that progress materializes.

The discussion of issues in the preceding sections of this paper identified a number of problems which currently exist with respect to cooperation in the Maritimes at the community college level. In professional development, program planning, curriculum development and human resource planning, there has been a lack of coordination in the Maritime Provinces. While there have been some ventures at the college level to achieve student access to programs, the process has been very much ad hoc. Further, each province has more or less acted on its own in a number of areas including the development of distance education, promoting co-operative education and establishing links with business. There has been some

degree of interaction and communication with respect to literacy services in the Maritimes; however, broader cooperation is integral for enhancing the development of regional literacy resources and services.

To address these issues it is recommended that:

1. The Governments of Nova Scotia and New Brunswick proceed with the ***Memorandum of Understanding Concerning a Program of Co-operation and Exchanges in the Field of Higher Education***.

2. That appendices of the ***Memorandum of Understanding Concerning a Program of Co-operation and Exchanges in the Field of Higher Education*** incorporate, but not be limited to, the following areas of cooperation/exchange: program planning, curriculum development, student access to programs, professional development, distance education, and literacy services.

3. That, as soon as possible, Prince Edward Island explore the possibility of becoming a party to the Memorandum of Understanding.

4. That a Maritime Provinces Community College (MPCC) Program Planning Committee be struck to (a) avoid unnecessary duplication of programs, (b) enhance accessibility to programs in the region (c) achieve more efficient mounting of programs, and (d) fulfil planning requirements under the Memorandum of Understanding (see #1 above).

5. That the MPCC Program Planning Committee include officials responsible for community college programming and officials responsible for labour market research and planning in respective provinces.

6. That the MPCC Program Planning Committee become the focal point for the regular exchange of labour market information among Maritime Provinces.

7. That Deputy Ministers responsible for major projects in the Maritime Provinces coordinate requests for labour market analysis of these projects on a Maritime basis, through requests to the MPCC Program Planning Committee.

8. That approaches for increased cooperation also be considered in the areas of: communication with industry, entrepreneurship training, cooperative education, and collaboration with universities in teaching development.

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APPENDIX 1

Summary of College Level Education in the Maritime Provinces

Appendix 1
Summary of College Level Education in the Maritime Provinces

Province	Government Department Responsible	Duration of Programs	Type of Programs	Population Served	Education Level of Entrants	Certification Awarded
ova Scotia	Advanced Education and Job Training	Most programs are 1 or 2 years in length. Other programs vary from a few days to a few months.	Programs are offered in the fields of Trades, Business and Applied Arts, and Technology. A variety of short duration upgrading programs are also available. In addition, Basic Education, and Literacy programs are offered.	Youth and adults in Nova Scotia primarily 18 yrs and over.	Minimum entrance requirements vary by program from grade 10 to 12. However, most entrants have grade 12. Upgrading, Literacy and Basic Education programs have various entrance requirements.	Diploma or certificate. A Certificate of Achivement is awarded for short duration courses.
rince Edward land	Education/Industry	To a maximum of 20 months.	Holland College offers programs in: business, hospitality and tourism, creative arts, sciences, justice, renewable & marine resources, applied arts, and trade & technology. The College is also repsonsible for the operation of the vocational high school program, vocational trade training, and adult and continuing education.	Holland College has 13 campuses across P.E.I.	- Post Secondary - Adult Vocational - Vocational High School - CEIC	Certificate/ Diploma
ew Brunswick	Advanced Education and Training	Trade and vocational programs are 1 year in lengt Career technology programs are 2 years in length. Other programs vary from a few days to several months.	A range of trade and vocational programs offered including technical, pre-employment and forestry. A variety of short duration upgrading programs are also available. In addition, Basic Education and Literacy programs are offered.	Youth and adults 16 yrs. of age and over.	Grade 12 or equivalent through a recognized adult education activity. Upgrading, Literacy and Basic Education programs hav various entrance requirements.	Diploma or certificate. A Certificate of Achivement or Participation is awarded for short duration courses.

APPENDIX 2

Maritime Provinces Higher Education Commission
Full-Time and Full-Time Equivalent of Part-Time Enrolment by Institution and Province 1990-91

MARITIME PROVINCES HIGHER EDUCATION COMMISSION (28 AUG 1991)

FULL-TIME AND FULL-TIME EQUIVALENT OF PART TIME ENROLMENT

BY INSTITUTION AND PROVINCE 1990-91

		Full-Time			Part-Time			TOTAL FTE		
		C.C.	University	TOTAL	C.C.	University	TOTAL	C.C.	University	TOTAL
New Brunswick	Maritime Forest Ranger School	78.00		78.00				78.00		78.00
	Mount Allison University		1856.00	1856.00		209.86	209.86		2065.86	2065.86
	University of N.B. - Fredericton		7114.00	7114.00		802.27	802.27		7916.27	7916.27
	University of N.B. - Saint John		1383.00	1383.00		345.92	345.92		1728.92	1728.92
	St. Thomas University		1496.00	1496.00		162.50	162.50		1658.50	1658.50
	Univ. de Moncton - Moncton		3940.00	3940.00		476.79	476.79		4416.79	4416.79
	Univ. de Moncton - Shippegan		316.00	316.00		236.36	236.36		552.36	552.36
	Univ. de Moncton - St. Louis/Maillet		573.00	573.00		206.03	206.03		779.03	779.03
	PROVINCE- Total	78.00	16676.00	16754.00		2439.73	2439.73	78.00	19115.73	19193.73
Nova Scotia	Acadia University		3490.00	3490.00		318.39	318.39		3808.39	3808.39
	Atlantic School of Theology		66.00	66.00		13.86	13.86		79.86	79.86
	Dalhousie University		8749.00	8749.00		887.17	887.17		9636.17	9636.17
	Mount Saint Vincent University		2076.00	2076.00		704.09	704.09		2780.09	2780.09
	N. S. Agricultural College	204.00	345.00	549.00	0.60	5.60	6.20	204.60	350.60	555.20
	N. S. College of Art and Design		517.00	517.00		91.12	91.12		608.12	608.12
	N. S. College of Geographic Sciences	173.00		173.00				173.00		173.00
	N. S. Teachers College		387.00	387.00		175.25	175.25		562.25	562.25
	Saint Mary's University		4611.00	4611.00		1206.56	1206.56		5817.56	5817.56
	St. Francis Xavier University		2797.00	2797.00		294.03	294.03		3091.03	3091.03
	Technical University of Nova Scotia		1037.00	1037.00		166.10	166.10		1203.10	1203.10
	University College of Cape Breton	600.00	1598.00	2198.00	64.50	337.30	401.80	664.50	1935.30	2599.80
	University of King's College		690.00	690.00		5.70	5.70		695.70	695.70
	Université Sainte-Anne		331.00	331.00		78.70	78.70		409.70	409.70
	PROVINCE- Total	977.00	26694.00	27671.00	65.10	4283.87	4348.97	1042.10	30977.87	32019.97
Prince Edward Island	Holland College - Charlottetown	660.00		660.00				660.00		660.00
	Holland College - Royalty	154.00		154.00				154.00		154.00
	Holland College - Summerside	153.00		153.00				153.00		153.00
	University of Prince Edward Island		2534.00	2534.00		384.40	384.40		2918.40	2918.40
	PROVINCE- Total	967.00	2534.00	3501.00		384.40	384.40	967.00	2918.40	3885.40
MARITIME TOTAL		2022.00	45904.00	47[illegible]	65.10	7108.00	7173.10	2087.10	53012.00	55099.10

APPENDIX 3

Maritime Provinces Higher Education Commission FTE Enrolments and Applicable Weighted FTE Enrolments by Institution and Province 1990-91

FTE ENROLMENTS AND APPLICABLE WEIGHTED FTE ENROLMENTS
BY INSTITUTION AND PROVINCE- 1990 91

		FTE					WEIGHTED FTE				
		C.C.	B/1st P	M	D	TOTAL	C.C.	B/1st P	M	D	TOTAL
New Brunswick	Maritime Forest Ranger School	78.00				78.00	0.00				0.00
	Mount Allison University		2059.86	4.00		2063.86		6642.02	12.00		6654.02
	University of N.B.- Fredericton		7124.05	615.22	177.00	7916.27		18920.90	2684.43	1210.00	22815.33
	University of N.B.- Saint John		1676.60	48.32	4.00	1728.92		3623.70	202.95	66.00	3872.65
	St. Thomas University		1658.50			1658.50		2891.80			2891.80
	Univ. de Moncton - Moncton		4105.40	307.39	4.00	4416.79		10226.30	1153.64	24.00	11403.94
	Univ. de Moncton - Shippegan		538.50	13.86		552.36		1119.50	52.47		1171.97
	Univ. de Moncton - St. Louis/Maillet		768.80	10.23		779.03		1763.60	40.92		1804.52
	PROVINCE- Total	78.00	17931.71	999.02	185.00	19193.73	0.00	43187.82	6146.41	1280.00	48614.23
Nova Scotia	Acadia University		3649.04	146.35	13.00	3808.39		8719.02	594.43	78.00	9391.45
	Atlantic School of Theology		55.33	24.53		79.86		155.49	66.63		222.12
	Dalhousie University		7769.71	1467.46	399.00	9636.17		25328.42	7396.19	2708.00	35432.61
	Mount Saint Vincent University		2659.00	121.09		2780.09		5281.50	490.96		5772.46
	N. S. Agricultural College	204.60	350.60			555.20	0.00	1318.00			1318.00
	N. S. College of Art and Design		591.82	16.30		608.12		2267.64	130.40		2398.04
	N. S. College of Geographic Sciences	173.00				173.00	0.00				0.00
	N. S. Teachers College		562.25			562.25		1289.50			1289.50
	Saint Mary's University		5371.50	446.06		5817.56		10486.40	1670.03		12156.43
	St. Francis Xavier University		2991.00	100.03		3091.03		6967.00	398.14		7365.14
	Technical University of Nova Scotia		875.79	231.31	96.00	1203.10		4439.33	1148.12	708.00	6295.45
	University College of Cape Breton	644.50	1935.30			2599.80	1080.95	3717.50			5598.45
	University of King's College		695.70			695.70		1272.90			1272.90
	Université Sainte-Anne		409.70			409.70		754.20			754.20
	PROVINCE- Total	1042.10	27916.74	2553.13	508.00	32019.97	1080.95	71996.90	11894.90	3494.00	89266.75
Prince Edward Island	Holland College - Charlottetown	660.00				660.00	0.00				0.00
	Holland College - Royalty	156.00				156.00	0.00				0.00
	Holland College - Summerside	153.00				153.00	0.00				0.00
	University of Prince Edward Island		2883.76	34.64		2918.40		7867.92	183.84		8051.76
	PROVINCE- Total	967.00	2883.76	34.64		3885.40	0.00	7867.92	183.84		8051.76
MARITIME TOTAL		2087.10	48732.21	3586.79	693.00	55099.10	1080.95	123052.6	16225.15	4774.00	145932.74

APPENDIX 4

Acts Establishing Maritime Provinces Higher Education Commission

ACTS ESTABLISHING THE MARITIME PROVINCES HIGHER EDUCATION COMMISSION

Office Consolidation

The following is an office consolidation of the Maritime Provinces Higher Education Commission Act (New Brunswick; Chapter 12, 1973; assented to June 7, 1973), An Act to Establish the Maritime Provinces Higher Education Commission (Nova Scotia; Chapter 10, 1973; assented to April 6, 1973), and an Act to Establish the Maritime Provinces Higher Education Commission (Prince Edward Island; Chapter 19, 1973; assented to March 16, 1973), as amended up to June 15, 1988.

N.B. Her Majesty, by and with the advice and consent of the Legislative Assembly of New Brunswick, enacts as follows:

N.S. Be it enacted by the Governor and Assembly as follows:

P.E.I. Be it enacted by the Lieutenant-Governor and Legislative Assembly of the Province of Prince Edward Island as follows:

Section of Act			
N.B.	N.S.	P.E.I.	
1	1	1	This Act may be cited as the Maritime Provinces Higher Education Commission Act.
2	2	2	In This Act:
			(a) "Chairman" means the Chairman of the Commission;
			(b) "Commission" means the Maritime Provinces Higher Education Commission established under Section 2 (Secuon 3 - N.S.);
			(c) "Council" means the Council of Maritime Premiers;
			(d) "institutions" means the several post-secondary educational institutions listed from time to time in Schedule A (to this Act - N.S., P.E.I.);
			(e) "higher education" means the education and training provided in or by the several institutions listed from time to time in Schedule A (to this Act - N.S., P.E.I.);
			(f) "Provinces" means the Provinces of New Brunswick, Nova Scotia and Prince Edward Island;
			(g) "region" means the area comprised of the Provinces of New Brunswick, Nova Scotia and Prince Edward Island;
			(h) "universities" means the several institutions listed from time to time in Part I of Schedule A (to this Act - N.S., P.E.I.).
			COMMISSION
2	3	2	The Council shall establish a body to be known as the "Maritime Provinces Higher Education Commission" consisting of a Chairman and nineteen additional members.
3	4	3	The Council shall appoint the Chairman for a term of five years but may remove him for cause at any time.

Section of Act N.B.	N.S.	P.E.I.	
4	5	4	(1) The Council shall appoint the nineteen additional members as follows: (a) at least six from among the nominees submitted under section 5 (section 6 - N.S.); (b) at least six from among senior public officials and the executive heads of non-university institutions, and (c) at least six from the public at large. (2) At least one of the members appointed under each of the clauses (a), (b) and (c) of subsection (1) shall be drawn from each of the Provinces of New Brunswick, Nova Scotia and Prince Edward Island. (3) No two persons appointed under clause (a) of subsection (1) may be drawn from the same educational institution.
5	6	5	(1) There shall be a nominating committee consisting of (a) the executive heads of the universities; and (b) one representative appointed by (a representative from - N.S.) the Senate or equivalent academic body of each university, which committee shall nominate persons for appointment under clause (a) of subsection (1) of section 4 (section 5 - N.S.) and subsection (3) of this section. (2) The nominating committee shall, within two months after this Act comes into force, submit to the Council the names of ten persons, and the members appointed under clause (a) of subsection (1) of section 4 (section 5 - N.S.) shall be selected from such nominees. (3) Where a vacancy occurs among the members appointed under clause (a) of subsection (1) of section 4 (section 5 - N.S.) the nominating committee shall submit to the Council the names of two persons and the Council shall, subject to section 4 (section 5 - N.S.), appoint one of such persons to fill the vacancy for the balance of the term of the member replaced. (4) At least sixty days before the expiration of the term of a member appointed under clause (a) of subsection (1) of section 4 (section 5 - N.S.), or under subsection (3), the nominating committee shall submit to the Council the names of two persons and the Council shall, subject to section 4 (section 5 - N.S.), appoint one of such persons to take office on the expiration of such term.
6	7	6	Where a vacancy occurs among the members appointed under clause (b) or (c) of subsection (1) of section 4 (section 5 - N.S.), the Council may, subject to section 4 (section 5 - N.S.), appoint a person to fill the vacancy (a) for the balance of an unexpired term, or (b) for a new term where the vacancy resulted from expiration of a term.
7	8	7	A member of the Commission, other than the Chairman, shall hold office for three years from the date of appointment or such lesser period as the Council may determine when making the appointment.
8	9	8	A vacancy in the membership of the Commission shall not impair the right of the remaining members to act so long as at least eleven members, including at least three members drawn from each of the three Provinces, hold office.

Section of Act N.B.	N.S.	P.E.I.	
-	-	9	A Chairman or other member of the Commission, on expiration of his term of office, is eligible for re-appointment to the Commission.
	10	-	A Chairman or other member upon completion of his term of office is eligible for reappointment to the Commission.
7	11	10	The Chairman and other members of the Commission shall be paid such remuneration as may be determined by the Council and such actual and reasonable expenses as are incurred by them in the discharge of their duties.

PURPOSE

-	12	11	The purpose of the Commission is to assist the Provinces and the institutions in attaining a more efficient and effective utilization and allocation of resources in the field of higher education in the region.

DUTIES

8	13	12	The duties of the Commission are, in or after consultation with the institutions and other parties involved,

(a) to advise the Council with respect to existing needs in the field of higher education in the region;

(b) to formulate plans for the future structure and development of higher education in the region, including an assessment of the cost of implementing such plans;

(c) to make recommendations to the Council as to the advisability of establishing or supporting new courses, programmes and institutions, and of terminating support of existing programmes;

(d) to assist and encourage institutions in establishing or continuing cooperative arrangements among themselves;

(e) to encourage and facilitate the establishment of regional centres of specialization in the field of higher education;

(f) to facilitate the making of arrangements with agencies outside the region to supply higher educational services which are not available in the region or which can be obtained more economically from such agencies;

(g) to recommend to the Council formulas in relation to the respective contributions of funds to be made by the Provinces and to the allocation of such funds among the institutions in the region;

(h) to prepare for the Council annually a comprehensive plan for financing higher education in the region, including provision for financing the operation of the Commission;

(i) to administer the funds paid to it by the Provinces, in accordance with the approved financial plan and formulas respecting allocation;

(j) to recommend to the Council programmes of financial and other assistance to students in the region;

(k) to recommend to the Council additions to or deletions from Schedule A; and

Section of Act N.B.	N.S.	P.E.I.	
12	13	12	(l) to undertake such other responsibilities within the scope of its purpose as the Council shall assign to it.

POWERS

13	14	13	The Commission has all such powers as are necessary for, and ancillary to, the proper performance of its duties, including the powers (a) to engage staff within the plan of personnel establishment approved by the Council; (b) to establish advisory committees; and (c) to enter into contracts where and to the extent that funds have been made available for such purpose.
14	15	14	(1) The Commission shall meet at least four times each year at the call of the Chairman. (2) Subject to section 8 (section 9 - N.S.), a majority of the members holding office shall constitute a quorum for the purpose of conducting a meeting provided that at least two members appointed from each province are present at such meetings. (3) Subject to this Act, the Commission may adopt by-laws respecting its internal organization and the conduct of its business, and may include therein provision for the election or designation of a vice-chairman to act for the Chairman in his absence or disability or when the office of Chairman is vacant.
15	16	15	The Chairman is the chief executive officer of the Commission.

FINANCIAL PLANS AND REPORTS

16	17	16	(1) The Council shall approve annually a plan for financing higher education in the region, including the operation of the Commission, which shall be submitted to the Lieutenant-Governor in Council (Governor in Council - N.S.). (2) The plan submitted to the Lieutenant-Governor in Council (Governor in Council - N.S.) shall (a) contain a statement as to the cost-sharing arrangements suggested by the Council for financing higher education and the operation of the Commission; and (b) indicate the expenditures to be incurred by each Province if the suggested cost-sharing arrangements are adopted.
17	18	17	If the financial plan and cost-sharing arrangements suggested therein are approved by the Lieutenant-Governor in Council (Governor in Council - N.S.; Lieutenant-Governor-in-Council - P.E.I.) of New Brunswick, Nova Scotia and Prince Edward Island, there shall be introduced in the Legislature a resolution for appropriations to enable the Province to carry out its obligations under the plan.
18	19	18	The Minister of Finance shall pay out of the Consolidated Fund (a) to the Council such amounts as are appropriated by the Legislature for financing the operation of the Commission; and

Section of Act N.B.	N.S.	P.E.I.	
			(b) to the institutions, either directly or through the Council, such amounts as are appropriated by the Legislature for the benefit of the institutions.
			(1) The fiscal year of the Commission shall commence on the first day of April in each year and end on the 31st day of March in the year next following.
			(2) The accounts of the Commission shall be audited in accordance with the procedure adopted for auditing the accounts of the Council.
			(3) The Commission shall, within six months after the end of each fiscal year, submit to the Council a report containing
			(a) a review of the Commission's activities during such fiscal year;
			(b) statements and recommendations regarding such matters in the field of higher education in the region as the Commission considers advisable; and
			(c) the audited financial statements of the Commission for such fiscal year.
			(4) The annual report of the Commission shall be tabled in the Legislature within fifteen days after receipt by the Council, or, if the Legislature is not then sitting, within fifteen days after the commencement of the next sitting thereof.
			GENERAL AND TRANSITIONAL
20	21	20	(1) The Council may recommend to the Lieutenant-Governor in Council (Governor in Council - N.S.) the making of additions to or deletions from Schedule A.
			(2) If a recommendation made under subsection (1) is approved by the Lieutenant-Governor in Council in (Governor in Council in - N.S.; Lieutenant-Governor in Council of - P.E.I.) the Provinces of New Brunswick, Nova Scotia and Prince Edward Island, the recommended addition or deletion may be effected by means of complementary orders in council in the three Provinces.
21	-	-	(1) The powers and duties of the New Brunswick Higher Education Commission under the Post-Secondary Education Act are hereby transferred to the Commission to the extent that they are within the scope of the powers and duties otherwise vested in the Commission by this Act.
			(2) The Commission may delegate any of its powers to
			(a) the New Brunswick Higher Education Commission in relation to higher education within New Brunswick and in relation to New Brunswick residents who may be outside that province;
			(b) the University Grants Committee of Nova Scotia in relation to higher education within Nova Scotia and in relation to Nova Scotia residents who may be outside the province; and
			(c) the Prince Edward Island Commission on Post-Secondary Education in relation to higher education within Prince Edward Island and in relation to Prince Edward Island residents who may be outside that province.
			(3) The New Brunswick Higher Education Commission shall continue in existence for the purpose only of exercising powers delegated to it under subsection (2) until such time as Section 23 of this Act is proclaimed.

Section of Act N.B.	N.S.	P.E.I.	
	23	-	(b) by striking out the words "or the Committee" in the second line of clause (g) of section 5; and (c) by repealing clause (h) of section 5.
-	-	22	An Act to Establish a Commission on Post-Secondary Education, being 17 Eliz. II (1968) Chap. 10 is hereby repealed.
24	-	23	This Act or any provision thereof shall come into force on a day to be fixed by proclamation.
-	24	-	This Act comes into force on and not before such day as the Governor in Council orders and declares by proclamation.

SCHEDULE "A"

PART I

Acadia University
Atlantic School of Theology
Dalhousie University
Mount Allison University
Mount Saint Vincent University
Nova Scotia Agricultural College
Nova Scotia College of Art and Design
St. Francis Xavier University
Saint Mary's University
St. Thomas' University
Technical University of Nova Scotia
Université de Moncton - Moncton, Edmundston and Shippagan
Université Sainte-Anne
University College of Cape Breton
University of King's College
The University of New Brunswick - Fredericton and Saint John
University of Prince Edward Island

PART II

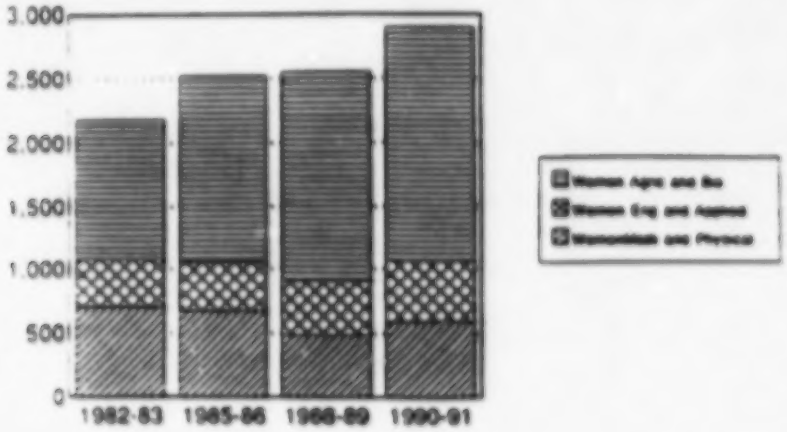
Holland College
Maritime Forest Ranger School
Nova Scotia College of Geographic Sciences
Nova Scotia Teachers College

APPENDIX 5

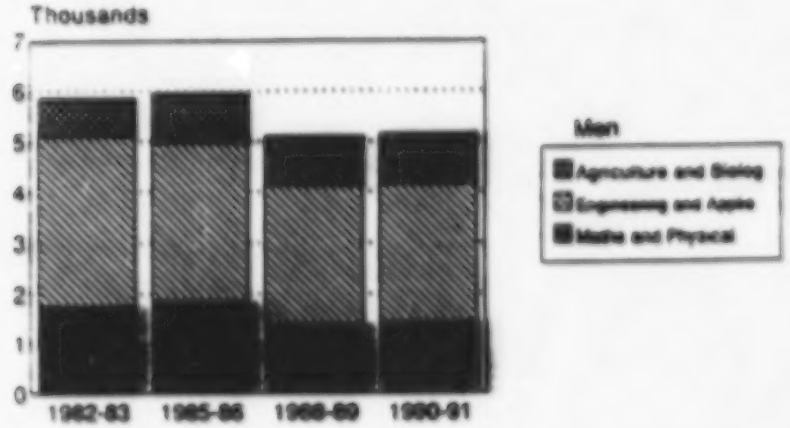
Maritime University Enrolments in Mathematics, Science and Engineering

Science and Engineering

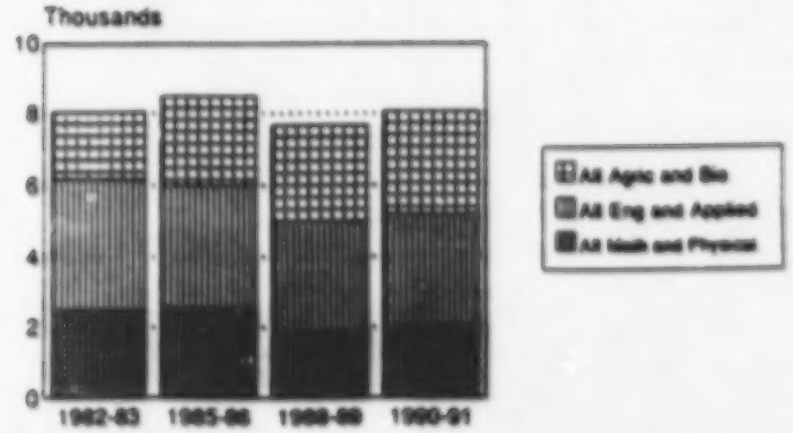
Enrolments by gender



Bachelor and 1st Prof.

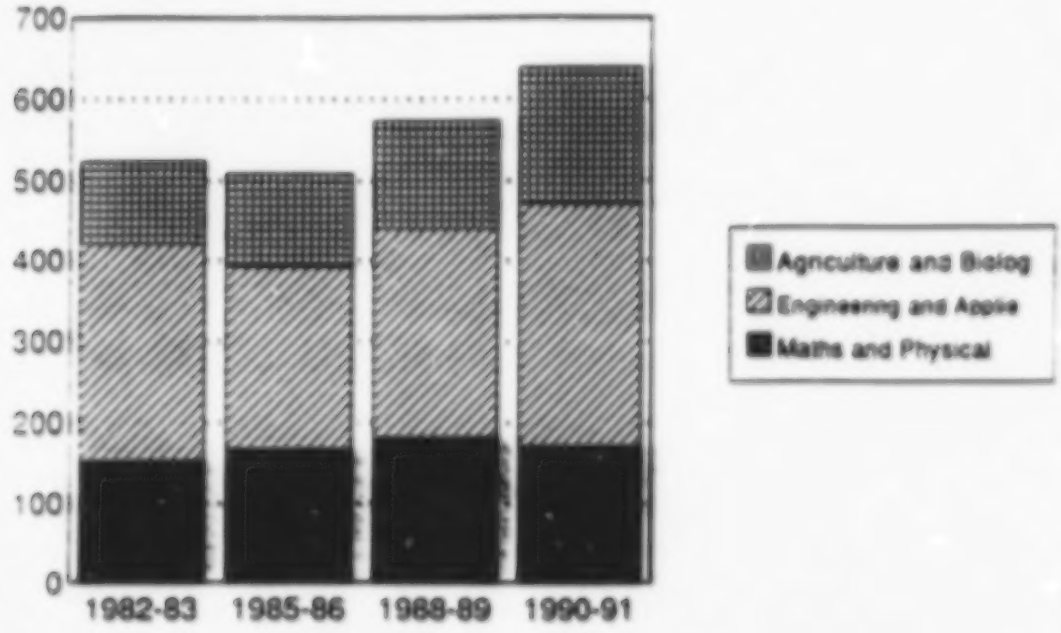


Bachelor and 1st Prof.

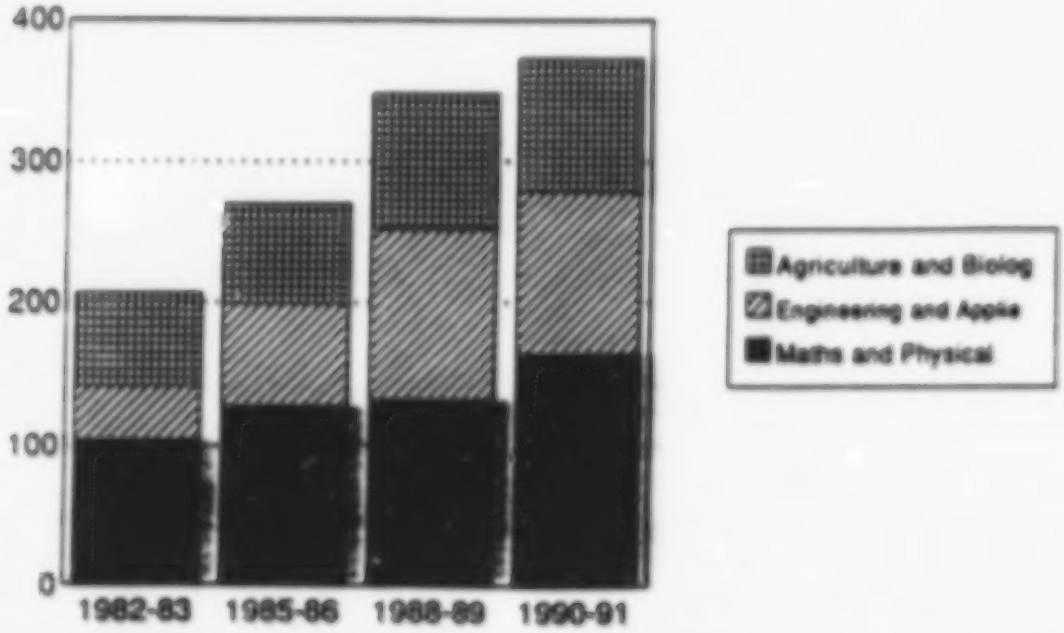


Bachelor and 1st Prof.

Enrolment changes
Masters Science



Enrolment changes
Science Doctoral



SOURCE: PROVINCIAL HIGHER EDUCATION COMMISSION

FULL-TIME ENROLMENTS IN ARTS AND SCIENCE
MARITIME UNIVERSITIES, BY GENDER

ALL ARTS AND SCIENCES

		LEVEL OF STUDY											
		B/1st P			M			D			TOTAL		
		GENDER			GENDER			GENDER			GENDER		
		Male	Female	TOTAL	Male	Female	TOTAL	Male	Female	TOTAL	Male	Female	TOTAL
REPORT YEAR													
1982-83	New Brunswick	2713	873	3586	193	69	262	92	13	65	2998	924	3906
	Nova Scotia	2979	1215	4194	230	50	280	116	25	141	3325	1300	4625
	Prince Edward Island	155	96	249	0	0	0	0	0	0	155	96	249
	TOTAL	5849	2180	8029	423	100	523	148	38	206	6468	2318	8734
1983-84													
	New Brunswick	2780	876	3656	201	61	262	83	13	96	3064	950	3994
	Nova Scotia	3003	1334	4341	190	76	266	133	40	173	3328	1450	4980
	Prince Edward Island	170	108	278	0	0	0	0	0	0	170	108	278
	TOTAL	5953	2320	8475	391	137	528	216	53	269	6562	2690	9252
1984-85													
	New Brunswick	2324	605	3131	227	48	275	94	15	109	2647	868	3515
	Nova Scotia	2567	1524	4091	206	76	282	177	62	239	2952	1660	4612
	Prince Edward Island	209	218	427	7	9	16	0	0	0	216	227	443
	TOTAL	5100	2947	7649	442	131	573	271	77	348	5815	2755	8570
1985-86													
	New Brunswick	2602	694	3296	230	64	294	92	11	103	2724	969	3693
	Nova Scotia	2520	1747	4267	218	94	312	200	78	278	2938	1811	4749
	Prince Edward Island	336	251	487	14	18	32	0	0	0	350	269	519
	TOTAL	5158	2692	8050	462	176	638	292	61	373	5812	3140	9061

MAJOR Agriculture & Biological Sciences

		LEVEL OF STUDY											
		B/1st P			M			D			TOTAL		
		GENDER			GENDER			GENDER			GENDER		
		Male	Female	TOTAL	Male	Female	TOTAL	Male	Female	TOTAL	Male	Female	TOTAL
REPORT YEAR													
1982-83	New Brunswick	242	305	547	19	10	29	9	4	13	270	319	589
	Nova Scotia	678	721	1199	50	23	73	30	13	51	564	757	1321
	Prince Edward Island	31	70	101	0	0	0	0	0	0	31	70	101
	TOTAL	751	1096	1847	69	33	102	47	17	64	867	1146	2013
1983-84													
	New Brunswick	300	373	673	20	10	73	10	1	11	330	381	711
	Nova Scotia	641	1018	1639	92	30	82	37	22	59	730	1070	1800
	Prince Edward Island	61	75	136	0	0	0	0	0	0	61	75	136
	TOTAL	1002	1468	2470	72	69	117	47	23	70	1121	1536	2657
1984-85													
	New Brunswick	287	385	672	17	16	33	13	1	14	319	402	721
	Nova Scotia	590	1074	1672	51	33	84	30	31	61	699	1138	1837
	Prince Edward Island	113	182	295	7	9	16	0	0	0	120	191	311
	TOTAL	990	1641	2639	75	58	133	43	32	97	1138	1731	2869
1985-86													
	New Brunswick	280	437	717	14	14	33	15	2	17	311	455	766
	Nova Scotia	628	1171	1796	51	52	103	68	30	78	724	1253	1977
	Prince Edward Island	130	212	342	14	18	32	0	0	0	144	230	374
	TOTAL	1038	1820	2855	81	84	167	83	32	95	1179	1934	3117

FULL-TIME ENROLMENTS IN ARTS AND SCIENCE
MARITIME UNIVERSITIES, BY GENDER

MAJOR Engineering & Applied Sciences

		LEVEL OF STUDY											
		B/1st P			M			D			TOTAL		
		GENDER			GENDER			GENDER			GENDER		
		Male	Female	TOTAL	Male	Female	TOTAL	Male	Female	TOTAL	Male	Female	TOTAL
REPORT YEAR													
1982-83	New Brunswick	1709	207	1916	125	14	139	20	3	23	1854	224	2078
	Nova Scotia	1587	160	1667	113	13	126	14	1	15	1634	174	1810
	Prince Edward Island	105	16	121	.	.	.	.	.	.	105	16	121
	TOTAL	3321	383	3704	238	29	267	34	4	38	3593	416	4009
1985-86													
	New Brunswick	1660	193	1853	120	12	140	39	6	45	1807	211	2018
	Nova Scotia	1350	171	1521	69	13	82	25	1	26	1444	185	1629
	Prince Edward Island	85	20	105	.	.	.	.	.	.	85	20	105
	TOTAL	3075	384	3459	197	25	222	64	7	71	3336	416	3752
1988-89													
	New Brunswick	1443	202	1645	138	17	155	44	9	53	1625	228	1853
	Nova Scotia	1183	205	1388	85	17	102	57	8	65	1325	230	1555
	Prince Edward Island	70	13	83	.	.	.	.	.	.	70	13	83
	TOTAL	2696	420	3116	223	34	257	101	17	118	3020	471	3491
1990-91													
	New Brunswick	1490	228	1718	157	26	183	60	7	67	1687	261	1948
	Nova Scotia	1099	239	1338	99	16	115	58	8	66	1256	263	1519
	Prince Edward Island	80	18	98	.	.	.	.	.	.	80	18	98
	TOTAL	2669	485	3154	256	42	298	98	15	113	3023	542	3565

MAJOR Mathematics & Physical Sciences

		LEVEL OF STUDY											
		B/1st P			M			D			TOTAL		
		GENDER			GENDER			GENDER			GENDER		
		Male	Female	TOTAL	Male	Female	TOTAL	Male	Female	TOTAL	Male	Female	TOTAL
REPORT YEAR													
1982-83	New Brunswick	766	359	1125	69	16	85	23	6	29	858	381	1217
	Nova Scotia	906	334	1328	67	22	89	44	11	75	1125	367	1492
	Prince Edward Island	19	8	27	.	.	.	.	.	.	19	8	27
	TOTAL	1777	701	2478	116	38	154	67	17	104	1980	756	2736
1985-86													
	New Brunswick	900	308	1148	33	14	47	34	6	40	927	328	1255
	Nova Scotia	1014	347	1361	69	33	102	71	17	88	1154	397	1551
	Prince Edward Island	24	13	37	.	.	.	.	.	.	24	13	37
	TOTAL	1878	668	2546	122	47	149	105	23	128	2105	738	2843
1988-89													
	New Brunswick	396	218	814	72	15	87	35	5	40	703	238	941
	Nova Scotia	706	265	1031	72	24	96	70	23	93	926	292	1220
	Prince Edward Island	26	23	49	.	.	.	.	.	.	26	23	49
	TOTAL	1408	486	1894	146	39	183	105	28	133	1657	553	2210
1990-91													
	New Brunswick	632	229	861	57	22	79	37	2	39	726	253	979
	Nova Scotia	796	337	1133	68	26	94	96	32	128	958	395	1353
	Prince Edward Island	26	21	47	.	.	.	.	.	.	26	21	47
	TOTAL	1454	587	2041	125	48	173	133	34	167	1710	669	2379